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The Indiana Convention.

The men who attend the Indiana Convention will get a big return for a slight expenditure in carfare and hotel bills. We do not believe that any state association has ever prepared a program which will bring out more information of practical value to the exchange manager than the one for the Indiana convention, printed on another page. The subjects to be discussed next week at the Indianapolis meeting are those which are uppermost in the minds of managers at the present moment, and in bringing out the ideas of men from all over the state, the meeting will have actual cash value for every member.

The Clearing House, to which Mr. Coffey has devoted so much work since last year's convention, has decidedly made good, but there is still a big field for extending its usefulness. We anticipate that the present meeting will result in an increased interest in its operation and knowledge of the kind of co-operation required from local companies, so that the toll business of the Independent companies in Indiana will benefit and become profitable beyond even their most hopeful expectations.

The success of the big district meeting at South Bend, last week, showed that interest in the organization is keener than ever, and we predict a big meeting and a good one for Indianapolis next week.

Competition Credited with Reduction in Ohio Long Distance Rates.

It may not be long before we shall hear a dignified voice emanating from the vicinity of Indianapolis, Indiana, setting forth, in good long dictionary words, a story for the public about telephone rates—particularly those for long distance talks in the territory largely occupied by the United States Telephone Company of Ohio. It will perhaps be made to appear in this story that the telephone company is ever regardful of the interests of the public, and so, although making not enough money to pay dividends, has reduced rates; that it will strive as heretofore to merit all the business the public will transact over its lines, etc., etc. The fact remains that while the Bell company reduced its rates first, its rival gets the credit in the popular mind, for the United States Telephone Company made its announcements, and not until then did its competitors jump in with a reduction.

It was a happy thought of the United States Telephone Company to put in its announcements of the proposed reduc-

tion the statement that it was in no wise to be considered as a war measure. The belief that its competitor is likely to suffer by the change might otherwise have produced an undue and harmful effect in the public mind.

Cutting rates to a point where service is furnished at less than cost is a bad thing for all concerned. In the long run the public pays not only for all the service it has had, but, in addition, the cost of a fight.

There are good reasons for crediting at full value the statement of the United States Telephone Company regarding the reason for the reduction. The present standing and constantly increasing strength of the Independent long-distance company has demonstrated the ability of the management to judge correctly in matters of large policy, and there is little reason to doubt the success of the experiment. With a plant built economically, a large volume of present business, with opportunity to rapidly increase this amount, and low operating expenses, there is probably no question but that it is safe to reduce the rates somewhat below the scale which has prevailed in Ohio. In fact, the trend of development of methods for handling toll business for some years past has been such as to lead to this result. Improvements in switchboard construction and operating methods, including the development of the plant and system for routing messages over long hauls, have increased the efficiency of handling business at terminals, so that out of the total time the circuits are used, including their use by operators for passing information necessary for setting up the connections, the paid time forms a larger proportion than formerly.

This has made it easily possible to handle a larger number of messages per day over each circuit. In addition to this means of augmenting revenue from its plant, the United States Telephone Company has been particularly active and successful not only in operating phantom circuits, which enable two pairs of wires to simultaneously carry three telephone messages, but in developing a leased wire telegraph business, which modern invention has provided means for transmitting over telephone wires without interference with talking.

In reducing rates at this time the United States Telephone Company has therefore followed one of the guiding principles of the Independent telephone companies, in sharing with the public the benefit of improvements which have reduced the cost of operation. In doing this, however, its managers have undoubtedly been partially actuated by the belief that increased business will provide a higher load for its wires, and thus increase gross earnings more rapidly than operating expense. Confidence in this outcome was essential, not only for the protection of the stockholders, but in the interests of the connecting companies. Of course there are certain well known limitations which determine the extent of such increase.

The mere fact of a reduction in rates will not enable the company to lower the quality of its service, and this means that if the desired result of increasing the number of messages over several parts of the plant is a consequence of the lower rates, the growth in business will soon compel the construction of new circuits. Lines and equipment will have to be provided for handling calls promptly at the period of maximum telephonic activity in the day, and, if anything, this peak load will increase by a larger rather than a smaller percentage in comparison with the load for less busy hours.

Regarding the soundness of the position taken by the competitor of the United States Telephone Company in reducing its toll rates, considered strictly as a business proposition, not so much can be said in its favor. In the first place the Central Union is a Bell company. If it admits that this was a war measure, New York, Boston, Chicago and Cincinnati will be all the more in a hurry to import a fighting competitor which will bring down the rates of their own Bell companies by 25 to 40 per cent, and this will be a more forcible demonstration to big business houses of the efficacy of competition in bringing reduced rates than any other which has arisen since Independent companies began to compel charges to be diminished. Then, too, the Bell company risks more than its competitor. It is generally believed, for good reasons, that this company has been using the receipts from its toll lines to make up, to a certain extent, for the unprofitable character of much of the local service it has given. If it is not successful in enlarging its business, and so increasing gross receipts from toll messages more rapidly than operating expense—and local conditions indicate that it is less likely to do so than its competitor—it will lose its last supporting strand; and then what will happen to its entire structure?

Timber Seasoning and Wood Preservation.

In recent years the importance of preserving timber from decay by the use of various antiseptics has been generally recognized in the United States. The value of properly seasoning timber before such treatment is not so generally known, but it is one of the most important features of treatment.

There are three main advantages to be derived from the proper seasoning of timber, namely: The increase in strength of the timber, the greater ease of injection of antiseptics for preserving the timber, and the saving in freight charges due to the decreased weight.

From thorough tests made by the Forest Service on various pieces of timber, it appears that thoroughly air-dry or seasoned timber has about double the strength of the green material. It is well known to all operators of wood-preserving plants that antiseptics are not only difficult to inject into green wood, but that it is practically impossible to obtain a uniformly satisfactory treatment of such material at an economical cost, for the purpose of insuring a prolonged life.

The last item would at first seem too trifling to be worthy of discussion, but from data obtained only recently it appears that western yellow pine lost 50 per cent of its green weight after three to five months' seasoning. This means a saving of 50 per cent of the freight charges and a corresponding saving in the handling of the timber, and is therefore a far too important point to overlook.

Considering these three points, it will be seen that there is not only a material saving in the seasoning of timber, but also a proportionate increase in the value of timber as a structural material. The seasoning of timber is never an expensive operation, even when done artificially. In the southern parts of the United States, a satisfactory degree of seasoning could be obtained by exposure of the timber to the air for a period of three to six months. In some of the northern states, however, a somewhat longer period is necessary to secure satisfactory results.

Little Things and How to Find Them

By H. P. Fairman

In the discussion of any problem or phase of the long distance telephone service, to depart far from the dollar and cents idea is impossible. Any fault in the construction or maintenance of the plant must directly affect the earning capacity. There is an intangible effect to selling bad service which cannot be accurately calculated. As is generally known, the direct result is the reduction of income. But whether the customer will again return to make further purchases is a matter of conjecture and uncertainty.

Some of the small physical or mechanical difficulties, which are at all times detrimental to the service, are easily avoided, and, when existent, may be economically remedied. A large percentage of intermittent troubles may be classed, according to causes, under the head "Insulation." Perfect insulation means perfect service for a certain and definite distance. This distance varies under different conditions, but it is generally understood that the commercial long distance transmission limit is for a circuit equivalent to 32 miles of No. 19 N. B. S. cable.

Trimming cannot be classed as a small matter. It is of

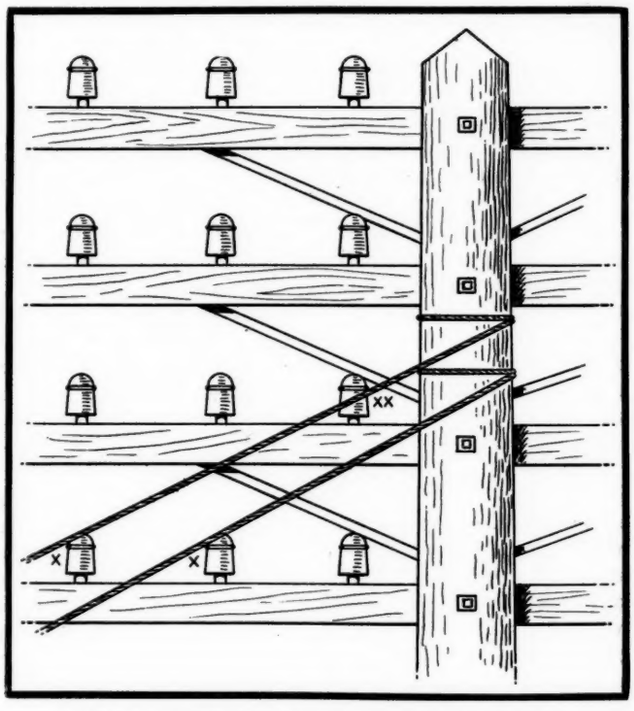


Fig. 1. Guy Wires Almost Touching Line Wires.

so great importance that to neglect it means almost a ruination of the service. Other small defects, in the aggregate, may have equal influence.

Go out on a line, and follow it from pole to pole observing closely the condition of every wire!

Here is a corner pole. Three different things are noticeable almost at a glance. The pole wires on the outer side, on all arms below the second, are within a half inch of, or even touching the pole, as shown in Fig. 2. In dry weather, this condition brings in no noticeable injury, but wet snow, fog, or rain will cause a variable escape to ground, whether or not the pole is provided with a ground wire or lightning rod.

Let us look further. Two stranded guys lead to anchors, from this pole. Observe them carefully! Fig. 1 will show their location. The diagram shows, at points, where line wires are almost grounded against guy wires. There is no doubt but that in wet weather snow and rain will form

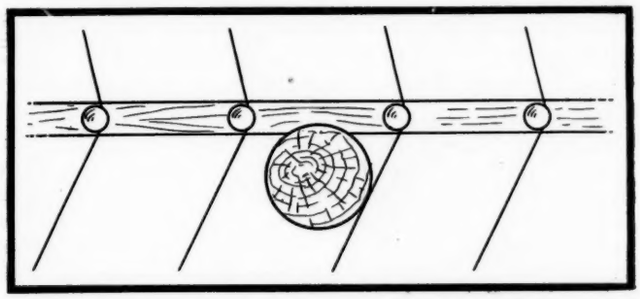


Fig. 2. Wires on Corner Pole Touching Pole.

a path for current to follow across the small intervening space. Even in damp, foggy weather, the escape from the line wire across so small an air space is noticeable. By test, using 110 volts of battery, wires three hundred miles long have been found to be perfect on clear cold days. During unfavorable weather, the writer has seen the same wires show an escape of 90 volts. This test was made upon wires on the end pins of the top arm.

Referring to Fig. 3, the wires on the pole pins are very close to the crossarm braces. It sometimes is necessary to space arms to secure clearance for the lower wires. In cases of this nature, the proximity of the pole, wires and the braces to each other should be noticed.

In all the above cases there is an easy remedy. It re-

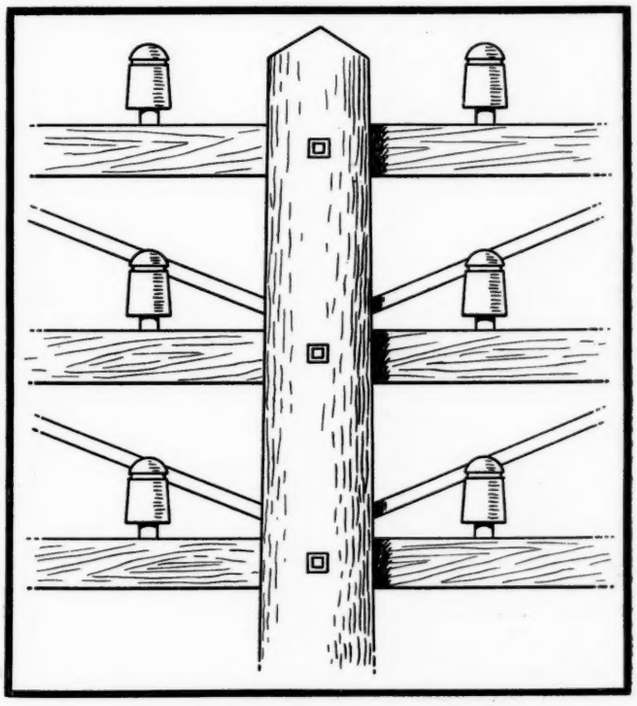


Fig. 3. Pole Pins Too Close to Cross-Arm Braces.

quires but a few minutes to set a new pin in the arm and move the wire to it. Sometimes clearance can be secured by tying the wire over to the other side of the insulator. This is bad practice, as it does not comply with specifica-

tions, and is liable to be retied by any lineman working on the pole.

Going along the line, the next thing which merits attention may be the transpositions. There are two styles in common use for straight line transpositions.

Under the old method (Fig. 4), known as the two pin

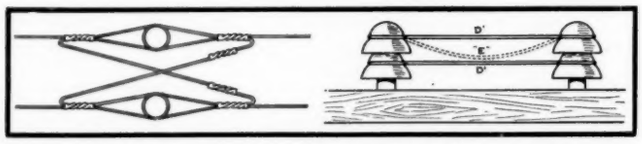


Fig. 4. Dotted Lines Show Common Defect in This Type of Transposition.

type, the standard insulators on both wires to be transposed are replaced with two piece insulators. The wires from both directions are dead ended at this point, and the tail wires of the transposed wires brought across and connected together;—thus one wire passes over the other, and if the work is properly done, as shown at Fig. 4—D' D', there is sufficient clearance.

However, examination will show many to be in a condition shown at Fig. 4-E. This is due to several causes, but mostly to careless work of linemen doing repair work or tying in new wires. Here the two wires of the bridge are so close that dripping water will close a circuit between the wires on a rainy day.

On the same pole we find a new type, or "single pin" transposition. Both wires pass around the insulator, and reverse their pin positions on the next pole. Notice carefully the top wire. If it has more slack, it will hang below the

MONITOR

CIRCUIT RX4 TROUBLE Noisy

DATE 4/3 9.40 A.M. BY Ss 6

DATE TIME	BY	TESTS
3/9.45a	V	O.K.
3/10.15	R	Noisy for 2 min
3/10 55	R	O.K
3/10.30	V	O.K
3/11.55	R	Noisy Send X to test pole
3/12.30	R	X puts short on circuit
3/12 38	V	get more noise Is brt. here "X"
3/12 50	V	Send "B" to test pole
3/12 59	V	Bcalls Noise clears when he puts an short
3/1.05	R	Tell test bd man at "Rx" to listen
3/1 15	R	"Rx" says noise came in once.
		Trouble between "B" & "X" 20 miles

Fig. 5. Form to be Used by Test Board Man to Trace Trouble on a Noisy Circuit.

wire in the lower groove and this allows the two to swing together occasionally (Fig. 6).

Out in a span you may notice a hand connection; that is, a connection in the line wires made without using a sleeve. With hard-drawn copper, to make a tight connection of this nature is almost a physical impossibility. Hard-drawn copper, if given a short turn "burns," making a weak place in the line wire.

In addition to this, when an attempt is made to draw the windings of a hand connection tight around the line wires, the wire, although "burned" and softened by the short turns, still retains enough "temper" or elasticity to draw away from the wire around which it is wound. Such a connection, if not actually loose enough to cause noise, will soon corrode and impair transmission.

There have been mentioned above some defects which may be classed as visible, as they should not escape the inspector's eye. In addition to these, there are certain invisible faults which must be located by other means.

Suppose a circuit is reported noisy every few days, but has baffled the efforts of the test board man. What special action shall be taken to locate this trouble? The trouble cannot be measured, and clears before men can be sent to the line to test. One thing is assured. It will continue to grow more and more aggravating, until finally the circuit must be thrown out of service. This may not be for weeks.

One plan which works out quite successfully is to fill in a form like Fig. 5, and require a test board man to "monitor" the circuit at least three minutes of each half

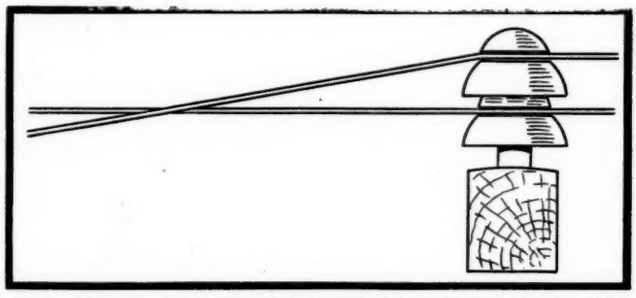


Fig. 6. Trouble on Single Pin Transposition Caused by Top Wire Being Slack.

hour, and as much oftener as possible. The entries on the sheet will appear as in Fig. 5. Each actual test secured eliminates a number of miles of circuit from one end or the other. Eventually the distance is reduced so that it is possible for a lineman to go out and climb every pole, and examine every sleeve, in that portion of the line where the trouble is known to exist, whether the trouble is on at the time or not. By disturbing a wire suddenly, a defective sleeve will usually be discovered.

The writer has known very peculiar cases of trouble to be discovered in this manner. A noise on a circuit was finally located in a two-mile open wire run. Nothing was visible from the ground. By climbing the poles the lineman found that at one place the line wire had been cut by a bullet, and held by the tie wires. The insulator, which was undoubtedly intended for the target, had been uninjured. At the time the cause was discovered, the line was quiet, and had been so for several days.

Barbed Wire for Transmitting an X-Z Language.

It is told, no matter on what authority, that a certain telephone company has no end of trouble with its wires. They were continually out of order. Nobody seemed to know why. An investigation was started.

Most of the subscribers in the territory where the trouble was, were Poles, Hungarians, Russians, etc. An expert, after due consideration of the matter, decided that the wires were unable to withstand the onslaughts of languages like Polish, Hungarian, Russian, etc.

"Can you suggest a remedy?'

"Certainly," answered the trouble shooter. "Substitute barbed wire."

The suggestion was followed. There was no more trouble.—*Telephone News.*

History of the Automatic Telephone

The Line-Switch

By Arthur Bessey Smith

Assistant Professor in Telephone Engineering, Purdue University.

In all the installations described hitherto, there was one first selector for each subscriber's line. As an automatic switch is a relatively expensive affair, it will be recognized that considerable capital is tied up in selectors alone. If these switches were in use all, or nearly all of the time, we might say that the expense is justified.

Experience has proven that for manual switchboards the average maximum number of simultaneous calls in any group of subscribers will not exceed ten per cent of the number of telephones. That is, in every hundred there will be not over ten connections up. Hence, if the same ratio holds for automatic work, even during the busy hour of the day only ten first selectors will be in use. But observations have shown that the average number of connections up at any instant on an automatic switchboard rarely exceeds five per cent. This is due largely to the instantaneous release which the automatic affords. On the manual board part of the cords are tied up by connections which the operator has not had time to pull down. Also it has been noted so uniformly as to be the undoubted truth that people answer the automatic telephone more quickly than they do the manual. Accepting five per cent as the average maximum traffic, 95 per cent of the first selectors are idle even during the busy hour.

If a group of 100 subscribers could be so arranged as to use ten first selectors jointly, there would be a saving of 90 per cent in the cost of first selectors, and they form the largest single item in the central office. This 90 per cent saving is partly offset by the cost of the device which is to render the ten first selectors accessible to the 100 subscribers.

The need for such a machine was recognized early by the Automatic Electric Company, but it was not till 1904 that it was sufficiently perfected to put out into service. On Nov. 3, of that year, the Keith type line-switch was installed at Wilmington, Del. The credit for the invention of this wonderful machine belongs to Mr. E. A. Mellinger, whose skill has been displayed at many points in the development of the automatic.

The line-switch consisted essentially of 100 rows of springs. Each horizontal row contained ten sets of springs, arranged on the arc of a circle. Each set consisted of four springs and four contacts, arranged as in Fig. 108, *S* and *C*.

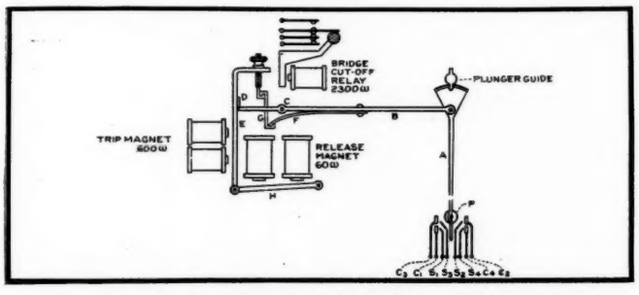


Fig. 108. Line-switch—Details of Plunger Mechanism.

The springs of a given row were multipled together, and connected to the three magnets on a certain line. In this way the horizontal rows each corresponded to one of the subscribers' lines. In each horizontal row the first set of contacts, *C C*, are multipled together and lead to a first selector. The second set of contacts in all the rows lead to another first selector, and so on for the ten selectors.

A long rod, *A*, fitted with a rubber roller, *P*, is adapted to be forced in between the springs of any set, thereby forcing the springs outward till they touch their respective contacts. This connects a subscriber's line to one of the first selectors. This roller and rod, *A*, are known as the "plunger." It is carried by an arm, *B*, to the end of which it is pivoted. The fan-shaped tail of the plunger has a notch which fits over a projecting edge of the plunger guide. The latter is a vertical bar, pivoted at the top and bottom and arranged to hold all the plungers in line and opposite the sets of contacts connected to a certain first selector.

When a subscriber calls up, his own plunger is moved away from the plunger guide, and, entering the set of springs of its horizontal row, forces them apart, connecting that line to the first selector which is idle. At the same time the plunger guide is automatically moved a little, so as to point all the remaining 99 plungers at the next set of springs. If a second line now calls, it will get the next first selector, and the remaining 98 plungers will be rotated to the next first selector.

Each plunger is controlled by the lever, *B*, and the set of magnets, which are mounted on a small plate and constitute a removable unit. In Fig. 108 these magnets are shown at the left. One set of bank springs is shown, but placed edgewise, which is not their natural position. The rest of the apparatus is shown as it would appear if viewed from above. Lever *B* is pivoted to the plate at *C*, while the other end rests against a stop, *D*, on the trip magnet armature, *E*. Lever *B* has riveted to it a spring, *F*, whose free end is held by a link, *G*, the latter being attached to an adjustable screw in the end of *E*. The tension of the spring, *F*, tends to drive the plunger, *A*, into the bank, but motion is prevented by the stop, *D*. But when the trip magnet in energized, in attracting its armature, *E*, it removes the stop, *D*, from lever *B*. The latter then, driven by the spring, forces the plunger into the set of springs opposite which it has been standing.

The trip magnet armature, *E*, is pivoted to the free end of the release magnet armature, *H*. When the release magnet is energized and pulls up, stop *D* is moved beyond the end of lever *B*, so that when the release magnet falls back the pressure of the spring, *F*, withdraws the plunger from the set of springs in the line-switch bank.

The mechanical arrangement of spring *F*, whereby it is made to produce these two opposite motions, is quite interesting and worthy of notice. The natural tendency of the spring is away from the pivot *C*, to bend itself still more than shown in the figure. The motion which it produces will always be that which is necessary to increase the distance between its free end and the lever *B*. Link *G* transmits the force of the spring to the armature *E*, and by stop *D* this force is exerted on the left end of lever *B* to which the spring, *F*, is itself attached. Thus we have a force acting with a tendency to produce rotation in one direction at the free end of *F*, and the same force tending to cause rotation in the opposite direction at *D*. Since the lever arm from *C* to *D* is longer than from *C* to *G*, the

* Continued from issue of May 1, 1909.

moment of the former will be greater, and the lever *B* will be forced back against the plunger guide. This motion allows spring *F* to follow its tendency to curl away from lever *B*.

When stop *D* is removed from contact with the left end of *B* the conditions are changed. Armature *E*, against

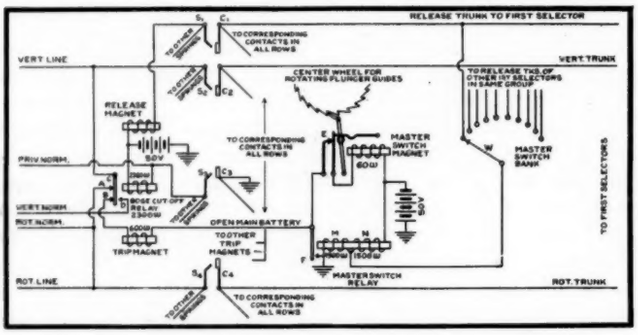


Fig. 109. Line-switch, as Installed at Wilmington, Del.

which the spring *F* is pulling can not move any farther, being against a stop. Hence the only motion which will allow the spring to curl away from lever *B* is for the left end to move back, driving the right end forward, carrying the plunger into the springs of the bank.

The plunger guide (which by its position determines which first selector shall be used by the next line to call up, is under the control of a motor magnet. This motor magnet, known as the "master switch magnet," acts, through a ratchet, on a center wheel on which are cams operating a lever attached to the plunger guide. In practice the 100 line units (of Fig. 108) are divided into four groups of 25 plates each. Each group of 25 has its own guide bar, controlled by the center wheel. As the center wheel revolves it moves all four plunger guides in exact synchronism, keeping all the idle plungers pointed at the same sets of bank springs.

A simplified diagram of the circuits of the master switch and one of the line units is shown in Fig .109. C_1, S_2, S_3, and S_4, are one set of springs and are adapted to touch the contacts C_1, C_2, C_3, and C_4, respectively. The springs are multipled to all the other springs in the same horizontal row and represent a certain line. The contacts are multipled to corresponding contacts in all the rows, and represent a certain first selector. When the plunger operates in this position, the four springs shown make contact with the four contacts shown.

The vertical and rotary lines coming from the left are the subscriber's wires from the substation. They are normally short-circuited by the main spring *C* and one back contact, *A*, of the bridge cut-off relay, both being connected through *B* with the trip magnet and negative (main) battery. Thus, a ground on either line will cause the trip magnet to operate.

The master switch magnet has attached to its armature a pawl which acts on the center wheel. It moves the latter on release, not on pulling up. The master switch magnet is controlled by the master switch relay, whose winding is in two parts. Each winding is of 1,500 ohms resistance, and the two are connected in opposition, so that although normally there is current flowing, the armature is not attracted.

Attached to the plunger guide is a wiper, *W*, which moves over the master switch bank. Each point of the latter is tapped onto the reelase trunk of one of the first selectors. The position of the wiper corresponds to that of all the idle plungers.

The first selector circuit which works with the line-switch is given in Fig. 110. The general arrangement of relays and magnets is the same as has been described before, and merits no special comment. The special features introduced by the line-switch are as follows: The release trunk coming from the line-switch bank runs to a contact, *C*, on the release magnet. This contact is operated momentarily by the back kick of the armature when the release magnet is de-energized. The off normal relay (5,500 ohms) is also attached to the release trunk, and to the first contact of side-switch 4. The off normal relay controls the individual off normal lamp.

The operation of the apparatus will now be described. The substation dial is arranged to give a preliminary impulse on the rotary wire during the pulling of the dial for the first digit. This allows current to flow from ground over the rotary wire to contacts *A* and *B* of the bridge cut-off relay, Fig. 109, through the trip magnet, contact *E*, and the master switch magnet to negative battery. This energizes the trip magnet, but not the master switch magnet, on account of the low resistance (60 ohms) of the latter. The action of the trip magnet lets the plunger fly into the set of springs, S_1, S_2, etc., forcing them against their respective contacts.

At S_2 and S_4 the vertical and rotary lines are connected straight through to the first selector. At S_3 the bridge cut-off relay is grounded and energized, disconnecting the trip magnet at *B*, taking the short circuit off the lines at *A*, and connecting up the vertical normal at *D*. At S_1 the release is connected to the release trunk leading to the first selector. This last act places the release magnet (60 ohms) as a shunt around the winding *N* of the master switch relay, since the master switch wiper, *W*, is resting on this release trunk. This practically short-circuits the *N* winding, whereupon the *M* winding becomes effective and pulls up the armature, closing contact *F*. The master switch magnet now pulls up until its pawl catches the next tooth on the center wheel. Just then contact *E* breaks, cutting off the current, and a spring forces the armature back, carrying with it the pawl and center wheel. By this means the plunger guide is made to move all the idle plungers one notch over, so that each is opposite the next first selector. The master switch wiper, *W*, partakes of this motion and now rests on the next contact to the right, which is tapped onto the release line of the first selector which will be used next.

When the line switch tripped in on the first selector, the release magnet of the former became connected to the release trunk of the latter and fed negative battery to it. In Fig. 110 it will be seen that this caused current to flow

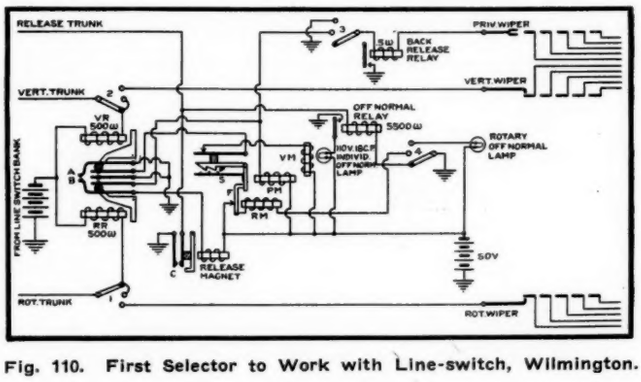


Fig. 110. First Selector to Work with Line-switch, Wilmington.

through the off normal relay, pulling it up. On account of its high resistance (5,500 ohms) it prevented the release magnet of the line-switch from energizing. The off normal relay caused the individual off normal lamp to light. If for any reason the apparatus failed to work, this light would continue to burn, calling the attention of the attend-

ant. But if the call proceeds as it should, the lamp will almost immediately go out and the rotary off normal lamp light instead.

It will be observed that the line-switch adds no impediment to the talking or signaling circuit, the vertical and rotary lines through it being clear of all attachments. The third wire (release trunk) takes care of the auxiliary functions.

In releasing, the vertical and rotary line wires are grounded at the substation in the standard manner. This causes the connector to release itself and also to feed current back over the release trunk to release the second selector, as has been previously described. In turn, the second selector feeds battery back over the release trunk to thh back release relay of the first selector, Fig. 110, pulling it up. This energizes the release magnet, which, when released, momentarily closes contact *C*, sending an impulse to the release magnet of the line-switch, Fig. 109, releasing the latter. The plunger being withdrawn from the bank springs rests against the plunger guide till the latter has rotated far enough to allow the notch on the fan-shaped tail, Fig. 108, to fit over the edge of the plunger guide.

Fig. 111 shows the change made in a single 100 group by the use of the line-switch. The space inside the broken line would, on the old system, be filled with 100 first selectors. These are now replaced by the line-switch and ten first selectors. There is a great reduction in the space required in an exchange.

THE SUB-OFFICE.

The cost of a telephone plant may be divided into three classes:

1. Cost of apparatus.
2. Cost of land and buildings.
3. Cost of wire plant.

The last is the largest item. It may be from half to two-thirds of the total cost of the exchange. Losses in it are to be carefully watched. If by any device its cost can be reduced, it should be provided.

Suppose we have 100 subscribers living three miles from a central office, from which they are supplied with telephone service. To give them satisfactory service will require 100 circuits three miles long. During the greater portion of the day these lines are idle, and even at the busy hour perhaps only ten of them may be in use at any one time, the other 90 being unused. To prevent this waste of unused property party lines have been proposed. They are at best a poor remedy. If we put a sufficient number

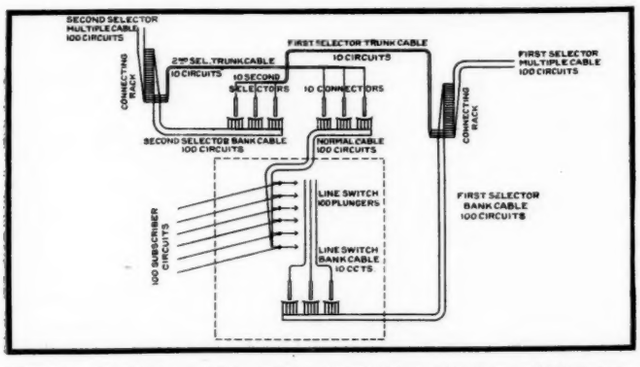

SECOND SELECTOR MULTIPLE CABLE 100 CIRCUITS
CONNECTING RACK
2ND SEL. TRUNK CABLE 10 CIRCUITS
FIRST SELECTOR TRUNK CABLE 10 CIRCUITS
10 SECOND SELECTORS
10 CONNECTORS
FIRST SELECTOR MULTIPLE CABLE 100 CIRCUITS
SECOND SELECTOR BANK CABLE 100 CIRCUITS
NORMAL CABLE 100 CIRCUITS
LINE SWITCH 100 PLUNGERS
FIRST SELECTOR BANK CABLE 100 CIRCUITS
100 SUBSCRIBER CIRCUITS
LINE SWITCH BANK CABLE 10 CCTS

Fig. 111. Cabling and Arrangement of Line-switch in a 100 Frame.

of stations on each circuit to secure the desired wire plant economy, the service will be intolerably bad. On the other hand, if we limit the number of stations per circuit to the number which will give first-class service, the economy of wire is lost. There is only one thing to do, limit the number of circuits serving our 100 subscriber group to that required by the busy hour traffic and make each of the circuits available to all the subscribers.

With the manual system, the only way to accomplish this end is to place a branch switchboard at the center of the 100 substations, with an operator to trunk the calls to the main office. But the fixed charges of rental, operator's wages, light, heat, etc. ,make this more expensive than to extend the whole 100 circuits to the main office. Clearly, some mechanical device for switching is the only way to work economy in this direction if dealing with small groups.

A close examination of Fig. 111 will show how a beginning was made in this direction by the invention of the line-switch. It will be seen that the line-switch bank cable and the second selector trunk cable each contain ten circuits. It is therefore possible to remove the line-switch and the ten connectors from the main office and install them in the center of the 100 substations, connecting them to the main office by 30 wires. This is actually what was done, for the first time at Dayton, Ohio, and it proved to be a very great success.

(To be continued.)

When Elizabeth was a New Jersey City.

According to a story told at a banquet the other evening, the wife of a prominent business man over in New Jersey, went into the private business office of her husband during his temporary absence recently, and sat down to wait for him. A few minutes later the telephone rang, and wifey seized the receiver.

"This is Elizabeth," said the voice at the other end of the line, "and I want to speak to Mr. Smith."

"Mr. Smith is not in," answered the good lady in cold, hard tones. "Whatever you have to say may be said to me."

"You won't do," was the prompt reply, "I must speak to Mr. Smith."

"Look here, young lady," ragefully exclaimed wifey, "I am Mrs. Smith, and I want to know who you are that calls up my husband and insists on talking to him."

"I am the telephone operator at Elizabeth," sweetly replied the voice at the other end of the wire.—*The Telephone News.*

Telephone Troubles.

According to the following which was published by the Cleveland, Ohio, *Plaindealer*, the telephone borrower is active in that city, especially in apartment houses:

"Every time a member of the von Doe family went to the phone—and the von Does, it must be understood, are sure enough people out in the East End—a woman with a high pitched voice who seemed to give lots of absent conversational treatment, was talking to somebody about something. Or if she wasn't talking then, she would come loping along in a minute and butt into the conversation.

"Von Doe called up the telephone company and asked them to put him on another line, or if they couldn't do that then to come and jerk the phone out. Of course, the company, being a telephone company, did the latter.

"Then von Doe had a phone put in by the other company. The second day after the new phone was in place, a woman from a suite down stairs—a woman with a high pitched voice—came up to the von Doe suite and wanted to know if she couldn't borrow their phone—said she had noticed they had the other kind put in and that she had been wishing there was one of those in the building. After that she came up every day on her phone borrowing mission.

"Now the von Does have no phone. When he wants to talk to anybody von Doe goes three blocks east to the corner drugstore. He says the new arrangement is much handier."

Some Aspects of Rural Telephony*

By G. R. Johnston

In the period of patent monopoly, the building of telephone exchanges in small towns and telephone lines to farms was seldom undertaken. Important suburbs of large cities had telephones service only at high prices. The expiration of telephone patents gave opportunity to manufacturers for an Independent market, and to builders, in the field neglected by the Bell companies. From that time on the extension and multiplication of village and farm line service has been rapid. Its end is nowhere in sight. In Ohio forty-eight counties which, by the census of 1900, had no city over 5,000, contained about 40% of the total number of Independent telephones in the state, and about 20% of the total number of Bell telephones. Absolutely, this means about four times as many Independent as Bell telephones in these counties. The other counties, of course, have a great many rural telephones. The county of Clinton, whose largest city contained about 5,000 people, had, under the Bell control, three telephones on farms. Now the county contains about 3,000 Independent telephones and 400 Bell telephones. The Bell companies have to some extent followed the Independent lead in rural service.

In Franklin County, Ohio, outside of the city of Columbus, there are nearly 3,000 telephones among ten or eleven thousand households. It is expected that in time this proportion will be doubled, if not trebled.

The construction of rural exchange lines from the city exchanges has had its share in the spreading out of the city's area, in the establishment of suburbs and country homes, in the removal of city workers to farm and garden lands.

The principal use of farm line telephones has been their social use; although among the reasons for their placing, the protective and emergency ideas have been prominent. The business use for the farmer has been of slower growth. The telephones are more often and for longer times held for neighborly conversation than for any other purpose. The next greatest demand is for connection with that village with which the farmer does his ordinary trading, and next with with the nearest larger city, or county seat. The demand for truly long-distance connections, as to Pittsburg and Indianapolis, which is a very small percentage of the telephone demand, even in large business centers, is very nearly negligible from the farms and villages. For the most part it can be met by a village toll station, just as the telegraph demand is met by the instruments in the railroad station.

The rural telephone service has grown in two ways; by subscription to the regular exchange service of a commercial company, and by construction on the plans of mutual organizations. In my view of the matter, the latter is generally a stepping stone to commercial corporations. The mutual companies or partnerships have begun usually by co-operative movements to extend one or two wires along a given road and connect on these such persons as live on that road and are willing to pay their share of the cost of the line and instruments. Next the line on adjoining roads are brought together at some convenient point where connections can be made between them through a simple switchboard. There has been a tendency for lines thus constructed to combine on larger switchboards, with general improvement in their form of construction and service. Many small telephone systems built on this plan have run lines at their own cost to connect with a commercial exchange in the nearest town or city, paying a rate for the exchange service lower than the rate based upon the ownership of the lines and instruments by the commercial company.

Much of the rural telephone construction has been poor; the wire has not been galvanized to resist exposure to the weather, the lines have been grounded, the instruments have been of the cheapest, and their number on a line too great to permit ringing or talking except under favorable conditions. There have been "squirrel" lines running on fences; "turtle" lines hibernating in the mud for long seasons; "donkey" transmitters kicking back severely; "mushroom" batteries dying over night; and many other varieties of flora and fauna represented in their nicknames. Nevertheless, under these conditions, the telephone lines have served in considerable degree their primary purposes, as conceived by their builders, and a secondary purpose of education. They have enabled persons in isolated households to talk with other households. For many of them it is of little real importance whether they talk with one or another. They start visiting, and if the Jeffersons aren't home they will call on the Hamiltons, and perhaps the Madisons and Monroes also. From the use of the telephone in this way, desire grows for service that will respond to particular needs at a particular time.

Thousands of miles of telephone line have been built cheaply that would not have been built at all if the standards of good construction and service had been followed. When the farmer's roads have been too muddy, he has stayed at home. When his telephone line has been out of order through conditions not readily correctable, he has patiently awaited its repair. Had railroad building in the United States been obliged to follow the standards of building in England, with light grades, few or no curves, no grade crossings, and the like, some of the railroad service might have been better, but many large systems would never have been built. It is the fashion to decry cheap construction, but it should be considered how many times cheap construction is the only possible construction, or the most economical in the long run when the demand is in doubt. Very often telephone line building has come under that very large class of things which are worth doing, but are not worth doing well. The desire for telephones is not made to order: it grows.

In many neighborhoods telephone line building has been the first movement in which the farmers have voluntarily joined their money and work in an accomplishment outside of the ordinary routine. Through such experiences of the values and costs of co-operation and of corporate property and service, they find themselves led to a better appreciation of their own opportunities and abilities, and to take a more discriminating and less suspicious view of commercial and industrial projects.

Such local builders of farm lines have access, through the telephone competition, to large numbers of manufacturers and supply dealers from whom they buy, at competitive prices, all grades of material and apparatus from the cheapest to the best. One phase of the original telephone monopoly was the monopoly of the equipment market. To all appearances, one phase of the monopoly which it is sought to re-establish is likewise a monopoly of the equipment market. One of the conditions of most, if not all, contracts offered to rural companies by the Bell company for connection of any sort has been the use of Bell equipment.

*Abstract of paper prepared for the Convention of the Ohio Independent Telephone Association.

This, until very recently, has been leased under royalty, or sold, if sold at all, at a high price. The risk of telephone monopolization should not be underrated. There is a general tendency toward the monopolization of factory products for which the market is restricted. There is like tendency in the combination of interests which can protect themselves against effective competition by reason of patents, large capital, or the economizing effects of manufacture on a large scale.

In general, we may speak with favor of the cheaply built rural telephone connections which open new territory and bring a new vision of usefulness. The ultimate losses from poor construction and equipment may not be real losses. Telephones are worth much more to individuals and to the community than is ordinarily paid for them. Those who find themselves paying more than their original calculation may either charge up their cost to their particular telephone values, or to the value of the experience for future guidance.

We cannot speak so well, however, of the cheap construction and poor service which is sometimes brought into competition with well-built and well managed systems. Those who engage in such enterprises might better learn by observation and inquiry. Their errors are costly for themselves and the existing system, and consequently costly for the community.

The general use of competition is to get for the public the best or the cheapest, or both, which the separate competitors can produce. As a rule, competition entails some direct costs, just as does the administration of law; these direct costs being much more than offset by indirect valuable, if not indispensable, gains.

In the telephone business, competition is somewhat peculiar. In cities a division between exchange systems brings a direct saving instead of a direct cost. This grows out of the fact that a large system with free interchange of calls among all subscribers costs more for each subscriber than does a smaller system. Accordingly, the rates on the smaller system can be lower. Those who prefer the service at the lower price are in the great majority.

In smaller cities and towns, telephone competition follows the ordinary rule of competition in having some direct costs. The question of competition in such places becomes a question of balancing costs and benefits. In the rural communities, with the telephones widely scattered, the cost of competing systems becomes larger, especially with the larger number of those desiring general connection throughout the community without paying for more than one telephone. Direct competition thus becomes so costly that it is seldom desirable. This does not mean that its benefits may not be had without this cost.

Competition is of two kinds; that which is real and present, and that which is only threatened. If competition prevails in the cities and may be expected to extend into the country wherever neglect or abuse are in need of correction, such correction may usually be effected indirectly. Representatives of the community may propose either to encourage new building by the competing commercial company, or the construction by themselves of a competing plant. Such proposals, if made with due consideration and in good faith, will usually accomplish any proper and attainable purpose. The actual building of a competing rural telephone plant by those whose purpose is not the serving of the community but the driving out of a competitor, or by those whose plans are made in ignorance or misapprehension of the true costs and values of the business, may be defeating their own purposes at the same time that they are burdening the community with costs, divisions, and inefficiencies.

I have no wish to say anything against construction in competition with companies which are failing of their due to the community or abusing their position, as by excessive rates, under-development, inefficient service, or any sort of improper treatment. If those in control do not respond to well meant demands for proper treatment and service, then the virtual destruction of their plant by a competing one may be the only remedy.

Against the construction of competing plants which are not needed for such reasons as these, I should like to say something of discouragement and warning. The usual errors of their projectors are their misunderstanding of the relationship between costs and service, and their lack of appreciation of the growing demand for good and extended service. They commonly overlook the costs which come from the spreading of the system into new regions further away, requiring on the average more lines for each user. They commonly overlook the extra operating costs growing out of the increased service. They commonly overlook the costs of serving subscribers indiscriminately over toll lines, and of serving non-subscribers without check. They commonly overlook the cost of keeping up the lines in a good state of insulation, of repairing the damage from lightning and storm, the long drives to restore interrupted service and to get belated payments. Perhaps oftenest of all they overlook the early depreciation of cheap material.

Each of these and of other cost elements grows by small additions. They seldom appear in estimates, and do not make themselves very strongly felt in the early days of a plant. The expenses do not usually begin to grow faster than the revenue until after a considerable investment has been made. Then a drain upon the owners, or an increased charge upon the users, is deemed needful to protect the investment. There is a certain stubbornness in sending good money after bad, which too often stands in the way of an early understanding of the errors of this competing rural construction.

It is always difficult to restrict service. Many telephone companies have taken their start from the expectation of the early subscribers that they will have good and efficient and unlimited free calling all over the county or other large region. They fail to understand that everybody's calling is nobody's calling. They see the telephone on the wall, but they do not see the long stretches of circuit and the large number of telephones tributary to such circuits, a call from any one of which demands the exclusive use of the circuits for the time. It is a simple thing to say, "I am paying for this telephone; and if my neighbor wants to borrow it, he can have it." It ought not to be so difficult to see that the neighbor not only borrows the telephone in the house, but such use of lines as prevents others from making use of them. It ought to be simple enough to see that no company can afford to build all the lines which non-paying persons may desire to use, or that paying persons cannot afford to await their turn in a procession of non-paying users.

It is difficult to over-persuade or to combat the widespread desire to obtain something for nothing, or, what this really means, something at others' expense. The history of railroad passes was a history of increasing abuse, in spite of the best endeavors of many roads, until the law of 1887 took the free rides away from shippers and friends, and then a repetition of growing abuse until the law of 1906 took them away from public officials and others, down perhaps, to the lowest terms. Free passengers do not often crowd off pay passengers—a train will carry several carloads at a time. Free telephone calls do crowd off pay calls—a circuit will carry but one at a time. It is unfortunate that any telephone company should start out by accumulating troubles for the future.

Perceiving the need for a limitation of free calling, various methods have been adopted by different companies.

Some require a toll charge from every non-subscriber, although a distinction may be made between occasional individual accommodation and a habit of calling or transferring calls for neighbors. Some make calls free over the individual lines, on the theory that the receiving subscriber is benefited; and charge for calls which pass over party-lines or trunk-lines, because they may interfere with the use of the same lines by paying subscribers. Some permit free calls by subscribers on each exchange to each other exchange immediately adjoining, because this method permits every subscriber to talk to all his neighbors, even though their separation by short distances may put them on different exchanges. Some companies place toll lines at the disposal of particular subscribers for the payment of a regular monthly or yearly charge, either with or without a limit as to the number of calls. Others sell to particular subscribers the right to make a given number of calls over toll lines for a given sum of money, representing a lower message rate than the regular toll charge. When traffic tends strongly in one direction, as from villages and farms into the county seat or other trade center, it becomes easier to handle, and may require less restriction than where it is nearly equally divided between different directions.

In an endeavor to strike a proper balance between the character of the service and its costs, there is room for much difference of judgment on a particular plant. Opinion differs as to what is worth paying for. The rule seems to be that improvement in service will be called for increasingly. This is met by reducing the number of parties on a line, more ready attention to trouble conditions, more careful operating, and sometimes quicker and more satisfactory calling through selective-ringing and lockout devices. These all add to the expense, particularly those conditions which may require more frequent driving out on the lines. In some regions the company is obliged to choose between improvements for existing subscribers, and reaching out for new subscribers. Few of these problems can be solved to the satisfaction of all alike, but reasonably good service at reasonable rates generally commends itself to nearly all users. It is desirable that these users be brought to see the difficulties with which a telephone company must contend.

Among the costs which lead to the building of competing rural plants by the farmers themselves are the desire to find investment for their own funds and a return for their own labor. Commercial companies can frequently meet these desires by soliciting subscriptions for their own stock, and procuring some part of their labor, directly from the territory of their subscribers.

Farm labor is irregular. Unfortunately, the busy season for farmers is the best season for telephone construction. A telephone company can, however, accord some recognition to the rural community which it serves, by hiring monthly, men from its members, letting special jobs, as of hauling poles and other supplies and digging holes, buying horse-feed and other supplies from the farmers, boarding workmen with them, etc. The workmen with their special tools can frequently build up a friendly interest by occasionally helping the farmers in setting posts, opening drains, moving heavy bodies, extra tree trimming, supplying discarded wire, and the like,

The home-built telephone lines get most of their labor from the farmers. Nearly every telephone company would like to get the assistance of its capable subscribers in the repairing of lines, replacement of batteries, adjustment of instruments, etc., which require so much more of travel than they do of work. It is a problem in this respect to get the services of the capable ones without leading the incapable and the meddling to do more damage than the others do good. There are certain simple things which can be taught to practically every telephone user in respect to the evidences of trouble, and its testing and definite reporting, so as to help out the exchange manager. The more this list can be safely enlarged the more money the company will have for dividends or extensions.

Those rural organizations which have developed their own territory and seek to connect with commercial exchanges have a direct interest in the existence of general competition. Those who sought toll line connections in the early days are well aware of this fact. There was but one interest to which their lines could be brought for connection, and their applications were either turned away entirely or met with prohibitive terms. With competing interests, the connection is likely to be welcome and the terms fair. With competing interests generally in a given territory, it is not so needful that there be competing interests at each particular point in order to protect the prices. Even at non-competitive points the customary competitive rates will probably apply. If there is only one general interest, then the customary price is pretty sure to be a high price.

While one of the two large competing telephone organizations has monopolistic purposes there are likely to be felt the evils of discrimination in dealing with the companies connecting or seeking to connect with its lines. Low prices and favorable terms may be offered as a war-measure to those whom it seeks to win away from their natural allegiance, to be offset by terms particularly unfavorable where monopoly exists, and, we may feel confident, to be further offset by specially oppressive terms if the expectation of complete monopoly is ever realized.

We are sometimes accused of inconsistency in talking for competition in some places, and against it in others. It may be well to illustrate the nature of the potential competition which we say is an efficient substitute in part for present competition. It may be likened to the police force in a city, which the householder is pleased to assist in maintaining, although he may not see a policeman on his own street twice in a year, and may not call upon one for assistance twice in a lifetime. The householder likewise contributes to the maintenance of the city fire department, and pays premiums into an insurance fund, although he hopes never to make use of either. The ordinary citizen hopes to have little to do with courts, but he knows that without them, not only in his own county but also in adjoining counties and throughout the state and nation, his property and life would be worth little or nothing. So it is with competition; he bears some of its costs, and lives in an industrial world which without it would be chaotic. He can point to particular conditions under which its immediate action is unnecessary.

The question of competition or no competition is, of course, a much more important question than the choice between Bell and Independent connections. To say that the public, and the smaller telephone companies seeking toll connections, should have the valuable opportunity of a choice between competitors and that the existence of the Bell lines undoubtedly keeps many Independent companies up to the proper sense of their responsibilities and duties, does not at all preclude a strong preference for dealing with the Independent interests, wherever these are on a fair and proper footing. They stand generally for the principle of competition. They stand particularly for wide development at the lowest profitable prices. They are the originators of the town, village, and rural telephone service. Almost without exception, they get their funds from local sources and redistribute them through the local territory. They have personal alliances with a large number of business interests in the region they serve.

It is sometimes argued that the smaller communities

might just as well get the benefits of the extra connections possible from competing toll lines by connecting their switchboard not with one toll system only, but with both. This end has been sought in some states to be gained through legislative compulsion. It is not impossible that some temporary gain might be brought to small communities by this process if the competitors would agree or could be forced by law to make such connections and to handle the proffered business fairly and efficiently. The process would, however, bring about the early monopolization of the business. It is hardly to be supposed that the relations between the competing telephone interests would long endure half-competition and half-partnership.

This has been made the subject of so many arguments that I do not think there is any need for going further into the subject at this time. It may be worth while to point out, however, that a compulsory process of dual connection would not only tend to restrict legitimate development, but would lead to the construction of a large number of small telephone plants hanging on to the self-supporting ones after the manner of parasites.

The rural mail delivery, the traction car, and the telephone are the material things that have changed many of the isolated and monotonous aspects of country life. Added to these is the knowledge that the scientists are beginning to teach the farmers—to the lessening of their labor and the expansion of their products. This education is greatly assisted by the means of ready communication. It is certain that these means will improve as the farmer comes to realize the many benefits which they bring to him.

Central Office Locations

By S. D. Levings

So far the basis of discussion has been purely theoretical, but in order to show the application in practice of the principle involved, a practical illustration will be helpful. In the work of locating the telephone center, which is coincident with the central office location, or as nearly so as physical conditions will permit, a map is needed. This should be a white print copy of the final map made from the results of the development study. On this white print should be placed the present and ultimate station figures, obtained from the preliminary development study record map. Having completed this work, the map should be carefully studied, in order to obtain as nearly as possible the telephone center by inspection of the line distribution. When such a point has been determined upon, it should be designated by a large red cross, so as to be readily distinguishable at all times. The streets which intersect at this assumed center should be designated by colored pencil for their entire length from one boundary line of the city to the other. This will divide the map into four rectangles, assuming that the corporate limits are laid out parallel to the streets. Fig. 3 represents a map with this work completed. The telephone center which has been located from inspection is assumed to be at O', the intersecting streets and rectangle boundaries by streets L and F, and the four rectangles by numbers 1-2-3 and 4. As has been stated, the number of telephones on each side of the axes L and F, respectively, must be equal, or nearly so, to make their intersection come at O', the telephone center. The best method by which to obtain the position of O' relative to the number of telephones is to add the present telephone figures in each of the large rectangles, and to place the sums in the center, as indicated on the diagram. Having the number of telephones in each rectangle, the numbers in each pair of rectangles which form the territory on each side of the respective axes are added, and the sums placed around the assumed center, in the form of a square, as shown. In the case of the example taken and illustrated in Fig. 3 the four rectangles are assumed to contain numbers of telephones as follows: No. 1, 2,019; No. 2, 1,214; No. 3, 3,690; No. 4, 2,421. Rectangles 3 and 4, lying on the east side of axis L total 6,111, and this number is placed at the east side of O'. Rectangles 1 and 3, lying north of axis F, total 5,709, which is placed north of O'; and in the same way the telephones west of axis L and to the south of axis F are obtained, and placed in their respective positions.

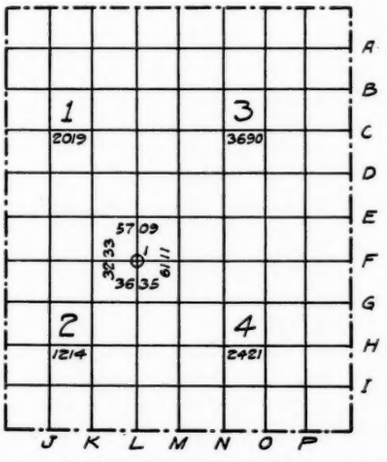


Fig. 3. Balancing of Lines Around Telephone Center Obtained by Inspection.

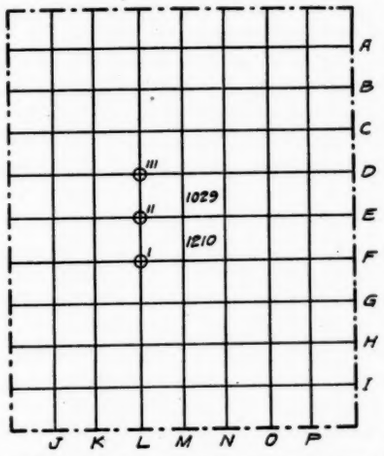


Fig. 4. Method of Balancing to Obtain True Center.

From a comparison of these results, it is shown that axis F is too far south by 2,074 telephones, and that axis L is too far west by 2,878 telephones. From this it is apparent that the assumed center O' is not in the theoretical location, and that it needs to be moved in a northwesterly direction. The next step, then, is to locate the final point

*Continued from issue of May 1.

by using the results obtained from the assumed location. The results above indicate that axis *F* is too far south by 2,074 telephones, and it is desired to determine some street as a new location that will subtract 2,074 telephones from the territory north of axis *F*, and add the same number to the territory south. The smallest sub-division that can be considered is the width of the block between two streets. Let Fig. 4 represent the same territory shown in Fig. 3, with *O'* still at the assumed center used in the first example. Let 1,210 telephones be the number of telephones in the territory between streets *F* and *E*. If the horizontal axis is now shifted, the smallest possible division will be to shift is to street *E*, and the telephones thus excluded from the original territory lying south of the original horizontal axis, will become a part of the territory north of the new location chosen from the horizontal axis. With the shifting of the horizontal axis, the telephone center is shifted, and in this case is shown at *O''*. The telephones when *O'* was formerly assumed as the center balanced as follows:

North of horizontal axis.....5,709 telephones
South of horizontal axis.....3,635 telephones

Difference .....2,074 telephones

But with *O''* as a center, the balance becomes:

North of horizontal axis.....4,499 telephones
South of horizontal axis.....4,845 telephones

Difference ..... 346 telephones

A comparison of these results shows that a balance has not quite been obtained with the shifting of the telephone center from *O'* to *O''*, but the difference has been reduced from 2,074 telephones to 346. A still further shifting of the center northward would result in it being located at *O'''*, as street *D* is the smallest division that can be made in which to locate the horizontal axis. The sum of the telephones in the strip of territory between *E* and *D* is assumed to equal 1,029. With *O''* as an assumed center, the balance was:

North of horizontal axis.....4,499 telephones
South of horizontal axis.....4,845 telephones

Balance .....346 telephones

with *O'''* as a center, and street *D* as the horizontal axis, the balance becomes:

North of horizontal axis.....3,470 telephones
South of horizontal axis.....5,914 telephones

Balance .....2,404 telephones

These results show that *O'''* is the nearest point to the absolute center and street *E* is the best location for the horizontal axis. In the same way, the balance should be obtained for the vertical axis, and extended until it intersects the horizontal axis. This point of intersection will be the telephone center, or the central office location, as determined by the estimated initial locations of telephones.

(To be continued)

An Operators' Meeting at Topeka.

At Topeka, Kansas, the Independent Telephone Company has been getting results in its operating room which speak well for the employees. That the people who make the telephone service for Topeka are the right kind was shown in other ways at the second Independent operators' meeting, held in the "rest room" last month. About sixty-five operators attended. The question box was opened and all questions found in it were discussed in open meeting. The questions pertained to operating problems, as seen from the operators' viewpoint, and the discussion brought forth small things which are not usually noticed unless the operators themselves bring them out. The service inspector's report was read and the following papers were read and discussed: "Relationship Between Toll and Local Operators," by Miss Ethel A. Pankey, toll chief operator; "Poem," by Miss Marian Bissell, operator, read by Mrs. Hill, chief operator; "Why We Hold Operators' Meetings," Miss Lizzie Kieffer, supervisor; "Long Distance," Miss Rose Myers, toll supervisor; "Local Room Observations," Miss Eunice Goodwin, operator. Before the meeting closed a light luncheon was served.

Following are abstracts of some of the papers:

Service Inspector's Report.

This report covers 352 service inspections. All inspections were made by silent service test methods. From the 352 tests, the following data have been obtained:

332 inspections with subscribers satisfied.
202 inspections with subscribers satisfied and no complaints.
130 inspections, subscriber satisfied but made complaints.
20 inspections, subscriber not satisfied and made complaint.
130 inspections, subscriber satisfied, but made complaints, subdivided as follows:
- 26 can't hear operator.
- 9 operator can't hear subscriber
- 3 operator doesn't repeat.
- 5 subscriber gets wrong number.
- 17 subscriber gets false rings.
- 5 operator slow on recall.
- 15 operator answers slowly.
- 6 can't classify as they are complaints of party line subscribers—party line quarrels.
- 34 instrument. All repaired; on these, subscriber did not complain.
- 18 General. Can't properly classify.
- 16 Complaint tracers issued and party satisfied.

20 inspections not satisfactory.
- 17 operating
  - 3 false rings
  - 3 central can't hear subscriber
  - 3 central talks too low.
  - 8 central slow.
  - 2 instrument trouble.
  - 1 can't classify—complaint of party line trouble, or party line quarrel.
- 7 complaint tracers were issued on these and the parties satisfied.

Stop watch tests gave the following results:

534 answering average time 3.3
328 recalls average time 4.9
36 information average time 11.5
19 long-distance average time 3.9

Local Operating Room Observations.

By Miss Eunice Goodwin.

We realize the fact that the service rendered to the public by a telephone company is due not only to the schedules and rules made by the management, but to the attention, and enthusiastic efforts made by the operators to obey them; in this way satisfactory service can be rendered to the public, and also to the company. Such service depends largely upon the careful co-operation of other departments.

The operators are one of the most important factors in the operation of telephone work. Many offices with poor equipment, but good operators are able to give better service than those with new equipment and inefficient operators. We, as operators in an office of new equipment, should produce the best of service.

An operator must not lose confidence in herself; to do

so would mean her failure as an operator. The reason why some operators make less errors and find more pleasure in their work is because they have acquired self-confidence.

The chronic fault-finders give more trouble to the operating room than any other department. But we must take into consideration that, in dealing with the public there are things which we, as a result of our training and daily experience understand with perfect familiarity; but which the public does not understand. Therefore we should give courteous replies to all questions in order to save as much trouble as possible. As the company's representatives whose work brings them in contact with the public, we must appreciate and fully measure up to our duty.

Long Distance.

By Miss Rose Myers.

Of course, each local operator handles a greater number of calls in a day than a long distance operator, but it should be remembered that we have on each call, a great deal of detail work, which a local operator does not have. When a local operator has established her connection she must watch her supervisory lights and disconnect when she gets the signal. If she has any trouble she calls a supervisor who takes it up and handles it to the best of her ability; if she is unable to handle it satisfactorily, she refers it to a higher authority.

I will now try and explain a few of our trials:

The recording operator takes the call from the party and records it. If the party is not at his own telephone, the call must be O. K.'d. Sometimes there is no one there to O. K. it, or he may be talking from what we call a "no toll telephone," meaning a telephone from which, for various reasons, we cannot take a long distance call; in either of these cases, the party must go to another telephone if he wishes to talk. This is not always convenient, and very often causes the calling party to become angry. This party hangs up with a very hard click, which is not very pleasant when the receiver is so near the ear.

Another party calls, we answer by saying "Long Distance" as soon as the drop falls. After repeating long distance several times, some one says, "Yes, I want the toll line," we say, "Yes, this is the long distance, what is it please?" The party is perhaps a man from some small town, calling his home. He imagines he is talking to his wife, and says at once in a very loud tone of voice, "Hello, Martha, is that you?" We tell him "No, this is long distance" and say, "Where are you?" He thinks we say "How are you" as he does not hear well, and will say, "Oh, I'm well, you getting along all right?" In many instances we are busy and have other calls to answer and, of course, we are apt to get nervous and somewhat angry, but must explain to him very pleasantly that this is the long distance and if he will tell us his name, where he is and what station he is calling, that we will call him as soon as we get his party on the line. He informs us that he is right here in Topeka at this drug store on the corner. We ask him the number of the telephone. He does not know, but tells us that he will wait on the line. As we cannot establish a connection in this way, we finally get him to ask someone the number. If he is talking from a booth, we tell him it will be fifteen cents, or whatever the rate is; to have the change ready, but not to register until we call him. He does not hang up, but stays at the telephone. The local operator gets her supervisory light, and, thinking long distance has not answered yet, rings again. We answer as before, and find it to be the same party, and tell him to please hang up the receiver and we will call him in a few minutes.

The ticket is now handed to the line operator, who passes it to the distant station. The operator gets the party called for at once and rings for the party at the booth. After being rung several times, he answers. The operator tells him to drop the money in the box. He has failed to get the change, so "hangs up in her ear." In a few minutes he comes back with the change, and perhaps drops it in before taking down the receiver. If not that, he does not know how to register. The operator explains it to him, but he does not seem to understand, but after a few minutes he drops the money in the right slot, or someone does it for him, and he is connected with his party.

I would like to say in conclusion something of what I know of the extension of our toll lines and their use in the last three years. We not only reach a far greater number of stations, but to some stations with which we have had connections for several years, our service has been greatly improved by the use of new lines which have been built at a great expense to the company, and also the installation of new switchboards at a great many places.

I believe this goes to prove that we are giving satisfactory service, otherwise, we would not have the generous support of our subscribers and the public in general that we now have.

Why We Hold Operator's Meetings.

By Miss Lizzie Kiefer.

It is to enable each to gain the knowledge that all possess that we attend these meetings, prepared and willing to discuss all difficulties that arise in our daily work, the different ways of operating, our experiences, opinions, and also for the sociability that comes from meeting together out of working hours.

The main object of these meetings is absolutely for the purpose of making every one feel that she is being helped in every way possible, to make her work easier, more pleasant and successful.

An operator has new experiences almost every day, and probably these are more important than she imagines, as it is the small things in telephone work which usually cause the most trouble if neglected. It is a good idea to discuss those little experiences at these meetings, and, by hearing different opinions on those subjects learn how to improve.

Another thing we should make it a rule to do is to make new operators feel more at home. A new operator needs a great deal of encouragement with all the trials of learning the mystery of telephone work.

Relations Existing Between Local and Toll Departments.

By Miss Ethel A. Pankey.

Each operator, whether toll or local, must feel that her work is a very important one to the company and that the manner in which she performs her work should be one of the governing points in the success of that exchange. She must be thoroughly interested in her work in order that the company may obtain the best results, and she should realize that success does not come to those who keep their eyes on the clock, or who are only thinking of pay day. Any telephone exchange, whether large or small, must deal with different dispositions and this requires tact and good judgment, but we must give service to the unjust as well as the just.

The service given by each individual operator is felt in every department of the telephone company. Some of you, perhaps, do not realize how much you can aid the collector; he may, perhaps, find many knots in the thread of his daily rounds, caused, we might say, by slow service, discourtesy, carelessness and many other seeming trifles. This applies to the toll as well as the local business. They are both important, and one is hardly complete without the other in

order to furnish the best service to the ever critical public.

The two departments are very closely related, yet one is no part of the other. Most particularly is it of the greatest importance that the different features of the toll service, such as codes, time limits, rates and all other various methods of handling toll service, be most carefully observed, as it is a question of dollars and cents for every error in this part of our service. Each lost call means lost money, while a lost local call is not directly a matter affecting the treasury.

A feature which is hightly appreciated by nearly every toll user is the attention of the operator to keeping him well posted of the exact condition of his call. If the line is busy, the number busy, party out for a few minutes, number does not answer, or any other report, the calling subscriber is immediately informed. Many calls are saved by reporting at frequent intervals what progress is being made. Many calls are also saved by the manner in which the operator makes the report. She can report in such a way that a man will want to use the line again. This has actually happened in the history of this exchange. A party placed a call, and had received two reports and talked, four minutes from the time he placed the call with the recording operator. He immediately called "Long Distance," thanked us in a very gracious manner for quick and good service, and complimented our attentive, pleasant but businesslike operators. In just such a way we feel that we have won more toll users than this, just by the kind of service we are trying to give them.

When the line operator receives the call from the recording operator she takes up the line of the party calling, if she thinks she can complete the call within five minutes, or at least have a definite report. This can easily be done in less time than this, unless the line to the station called is built up through several switching stations. The operator at the originating station satisfies herself that the proper person has been reached, and that easy conversation can proceed before conecting the calling party. If parties are not speaking directly into the transmitter, or with sufficient force, she instructs them in a courteous manner how to obtain the best results. This differs very much from local calls.

We have our trials and tribulations just the same as the local room has. Many things happen that try our patience and many amusing things happen, for instance:

A party called for some Nebraska point. We asked him his name, he told us, as he should, but he also added that he didn't live in Topeka, and gave us the name of the town where he did live. "Where are you talking from?" "Topeka." "But what telephone?" "Independent." "But whose telephone?" "I do not know, it is in a drug store." "But whose drug store." "On this side of the river." Now we did not have the slightest idea what side of the river he was on, but after our patience was almost exhausted, he decided he would not talk.

We once had a call for a party who lived "Just back of the State House." When we asked for further information, or a better address, or G. B. A. as we term it, we were informed that we were certainly not very well informed of the city or we surely would find them very easily. Another called for a party "Who is an old lady, lived in a square house that needed paint, and the house was located near a grocery store, which had a large oil tank in front of it."

Sometimes we feel that our troubles are many, but we must be able to surmount our difficulties when we see the great results that hinge upon our operating department, and if we do this our work has not been in vain.

Illinois Legislature Tries to Worry Telephone Companies.

On April 28 the Committee on Corporations of the Illinois House of Representatives took occasion to amuse itself with the telephone business. It reported favorably on a bill fixing maximum rates in cities of 100,000 population or more as follows:

For public telephones, $100 a year; for business telephones, $75 a year; for residence telephones, $18 a year.

In cities of less than 100,000 population, which includes every city in the state except Chicago, maximum rates are fixed as follows: Business telephones, $15 a year; residence telephones, $12 a year.

It also reported favorably on a bill for physical connection between competing companies.

It is not expected that these bills will receive very serious consideration in the House, as in other states where measures of this class have come before the legislature they have been promptly turned down.

The Telephone in the Courts

Conducted by A. H. McMillan

Verbal Rights of Way in New York.

In October, 1904, a company incorporated under the laws of the State of New York, purchased a telephone line two miles long running from A to B, N. Y. This line was constructed about ten years previous to this transaction, and was on private property the whole distance, being on the line fence between six or seven farms and the X river. At the time of its construction consent was obtained from all property owners, but no leases were signed. At the time of the purchase by the telephone company men were sent on and repaired the whole line. No fault has been found by the property owners until a few days ago, during a big wind storm, six poles were broken. As they were about to be repaired, the company was given notice by the farmers, by telephone, that it would not be allowed to repair the line and that it must remove the line from their premises, as we had no legal right to the right-of-way.

Can they force us to move this line?

Can they make us buy the right-of-way?

Can they charge us more than the actual damage?

Have we a right to repair the line without their consent?

Is the party of whom we purchased the line holden for the right-of-way?

We have had peaceable possession of this line for over four years.

When permission to build a telephone line over private property is verbally given, it is called a license, and is revocable at the will of the person giving it before being acted upon. After money has been expended, and the line actually built in reliance upon it, a verbal license becomes irrevocable. Wilson vs. Chalfant, 15 O., 248; 45 AM. Dec. 547; Berick vs. Kern (Pa.), 14 Serg, and R., 267, 16 A. D. 497. This being so, and we assume the rule to be adopted in New York, the farmers cannot legally force you to move your lien, buy the right of way, or charge you for damages. It therefore follows that you have the right to repair the line without their consent, and it becomes unnecessary to answer the question, whether the party of whom you bought the line would be holden for the right of way.

Rentals While Line is Out of Order.

Through this part of the country we had a severe sleet storm the latter part of February. A large number of telephones were out of order for two weeks, from Feb. 14 to March 1. We are allowing a rebate to all of our subscribers for the time they were out in March, but are collecting for February. We have a

few parties who say they will not pay for the time the telephones were out of order. We are writing to find out if you have any decisions on the subject. We did have a contract with the party and enclose herewith sample of our contract, but have lost this party's contract. We had 2,000 telephones out of order after the storm, and they were out of order from one to four weeks. Where they were out of order any time in March, we allowed them for the actual time they were out in March, but nothing for February.

We think you can collect during the time your line was out of order. Your contract with subscribers provides that the company shall not be liable for interruptions of service. It is held that a company is not liable for interruptions in service not preventable by ordinary care. Eastern Kentucky Telephone and Telegraph Company vs. Hardwick, 106 So., 307.

Implied Contract.

In one of our nearby towns we connect with a local exchange. We sent them a contract for their signature when we made the connection about a year and a half ago. They never signed it or returned it. Now the question is, is this contract binding? We can prove by eye-witnesses, and also their monthly reports show that they know its conditions.

Contracts may be express or implied. In the case you mention, there was clearly no express contract if they did not sign the paper you sent to them, or expressly agree to its terms and conditions. If they knew the conditions upon which you connected with local exchanges, and with the knowledge of such conditions, established connection with your exchange, they would be held to have consented to the conditions. If, however, they were first connected with your exchange and afterwards received from you the contract which they have not signed, they might not be held to have consented to the conditions of the contract. In such case, they would be bound by an implied contract to pay for the connection what it was reasonably worth.

Construction of Telephone Booths.

A telephone booth should not be so constructed that it cannot be opened from the inside. This is a rule for the benefit of the employees of the company, although it would be equally applicable to other persons as well. The case in which it was laid down arose in Kentucky, and resulted from an injury received by a bookkeeper in the office of the Georgetown Water, Gas, Electric and Power Company. In the machinery room was a telephone booth, the door to which had an ordinary lock on it, but the engineer had taken off the knob on the inside of the door, and had put it on another lock in the room. This left no knob on the inside of the door to be turned in opening it. The bookkeeper answered a call in the booth, and, when he tried to leave it, could not open the door because of the lack of the knob. He did not think of calling central to send some one to open it, but tried to burst the door open, and finally got the booth loose from the wall and made his exit at the back. When he got out he found his left hand was hurting him, and later his finger swelled, had to be lanced, scraped and finally became stiff. He recovered a judgment of $4,500. The court held that while the company was not an insurer, it should have used ordinary care to make the premises reasonably safe for the employee. Whether the bookkeeper, when imprisoned in the booth, used such care in escaping as might be expected from an ordinary prudent person, was held to be a question for the jury, but the case was reversed by the court of appeals of Kentucky on the ground that the verdict was palpably excessive. Georgetown Water, Gas, Electric and Power Company vs. Farwood, 113 S. W., 112.

This case reminds us of another case involving a pay station booth, decided by the same court. A guest at a hotel, going into a pay station booth to use the telephone, received a severe shock of electricity which knocked him to the floor. The company proved that ten minutes after the accident, the telephone was examined by one of its men, and found in good order. The cause of the accident was entirely unexplained. The court in that case affirmed a judgment for the telephone company. Brucker vs. Gainesboro Tel. Co., 100 S. W., 240; 16 American Telephone Journal, 9.

Failure of Company to Secure an Answer to a Sick Call Over Long Distance.

At Fort Worth, Texas, one McCoy got a judgment against the Southwestern Telegraph and Telephone Company for the negligent failure to notify him of a call from Cleburne to talk over the telephone with his wife as to the serious illness of their child. The court held that the same degree of care imposed by law on a telegraph company in delivering messages to addresses is imposed on telephone companies undertaking to secure answers to calls over long distance lines. The evidence was held to present a question for the jury as to whether the company, by merely telephoning to the round house, where McCoy was working, and ceasing further effort to find him on receiving an answer from the round house that McCoy was not there, exercised due diligence.

The call was put in by the brother of Mrs. McCoy, who told the operator to ring up the round house, that McCoy was working there about one hundred yards down the track. He waited until noon, and getting no communication with McCoy, left. Later, he told the operator that McCoy was working at the time-keeper's office, and if he was not there, the timekeeper would know where McCoy was working. The decision seems to us to be open to criticism, because the telephone company, from the evidence, called the round house as directed. The court thought that negligence might be inferred from the fact that there was no testimony showing that the operator informed the round house that McCoy was working on the track, or that there was a sick call for him. Southwestern Telegraph and Telephone Company vs. McCoy, 114 S. W., 387.

Rights of Telephone and Telegraph Companies.

A railroad company acquired by condemnation proceedings the right to cross the right of way and depot grounds of another railway company, and then authorized the Cape Girardeau Bell Telephone Co. of Missouri to erect poles in the right of way so acquired, and to string wires thereon for the service of the railroad company and the general public. In consideration of this grant, the telephone company agreed to permit the railway company to attach telegraph wires to the telephone poles for use and operation of the railroad. The wires did not interfere with the operation of either railroad, and the only disturbance of the soil was the digging of holes for the erection of the poles. The railroad company owning the right of way and depot grounds, across which the other right of way had been condemned, asked for an injunction to restrain the use of its right of way by the telephone company. This relief was denied by the Circuit Court and a decision sustained by the St. Louis Court of Appeals. The suit was prosecuted on the theory that the telephone service to be furnished to the public amounted to an additional burden upon plaintiff's right of way, and such contemplated service, if permitted, would amount to a taking of the plaintiff's property without just compensation.

The court, in denying the relief sought, said: "It is obvious that the mere commercial use of the telephone, under the circumstances mentioned, is entirely consistent, and in no manner interferes with the railroad's user of its easement." The court found that using the telephone line for commercial purposes did not create any additional burden on the right of way of the railroad company. St. Louis I. M. & S. Ry. Co. vs. Cape Girardeau Bell Telephone Company, 114 S. W., 586.

Practical Questions and Answers

Ringer Trouble.

I have some trouble for which I do not know a cure. We had a Kellogg "silent ringing" telephone on a line with 10 others. All at once it refused to receive a ring, after working O. K. for two years. We examined all connections to line and ground, and found all O. K.; changed the ringer coils and made sure springs at the end of the generator were O. K., but no result; brought the telephone to the shop, where it worked. We sent it out on another line, where it worked for an hour after the man left, then began the same trouble again. We have the telephone in the shop a second time and can find nothing wrong. Our method of testing circuits is by a receiver and one cell of battery. Ringing current ought to go where 1½ volts will pass.

After the second examination we connected it on a line 20 miles long, with 18 other telephones, and the most distant one rang it finely. Can you guess the cause for these actions?

We are also bothered with some old series ringers, the armature of which sticks to one pole so tightly that unless the ringing current is very strong it does not move. I think this is caused by the core being too hard, and thereby retaining some of the magnetism. Is there any cure for this aside from unwinding and baking the core to soften it, then winding it again?

The symptoms you describe for the first trouble may be due to any one of the following causes, stated in the order of their probability:

Hinge joints broken; ringer joints broken; poor connection at switchhook joint; shunt spring sticks, not allowing generator springs to make contact. Any one of these faults would make an intermittent trouble, such as you evidently have.

With regard to your series ringers, it is probable that you are using too heavy a ringing current for the present adjustment. All ringer cores are pot annealed. Any attempt to doctor them in an open fire will harden the iron.

Phantom Circuits.

We herewith hand you a diagram, Fig. 1, of a line we have proposed, and ask your opinion of its ability to give good service. We run two full metallic circuits from the central office in town

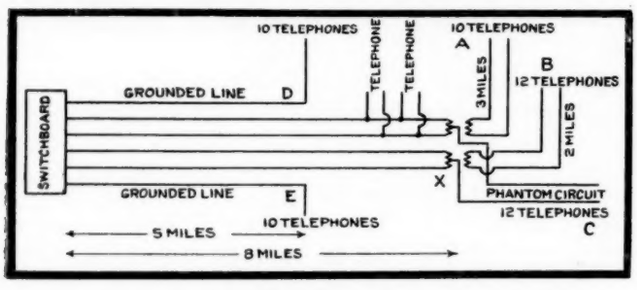


Fig. 1.

to the point marked "X," eight miles out. Here we put in repeating coils and get a phantom. About 12 telephones, on a metallic circuit meet the phantom at X. From X the physical metallic circuits are continued to points three and two miles further, marked A and B, where they are met by metallic lines carrying about 12 telephones each. The grounded lines marked D and E are on opposite sides of a 6 or 8-pin arm with the two transposed metallic circuits between. Is it possible to use the phantom as shown? Would it be all right to ground one side of the coil at point X on line C and have the telephones come in on a grounded circuit to point X? Will the grounded lines D and E cross-talk with each other? Is there any better way to handle it?

First, all the bells used on these lines must be bridged across the line, no ground connections being permissible.

Second, the repeating coils must be the best, and designed for "ring through" work, or you can not ring the distant telephones on the metallic line. The center tap, where the phantom is attached must be at the electrical center, or there will be cross-talk and noise.

Third, to prevent cross-talk between the grounded lines *D* and *E* and the phantom, and between the individual metallic circuits and the phantom, the latter will need to be transposed as in Fig. 2, with a regular phantom transposition, at suitable intervals.

Fourth, when you make switchboard connection between the phantom and other lines, a repeating coil should be used on the cord.

Fifth, the repeating coils at *X* will need protection from lightning. If the protectors get clogged and grounded by

Fig. 2.

discharges, you will have cross-talk and noise. Phantom circuits are sensitive to leaks.

We would not advise grounding one end of line *C*. The lines *D* and *E* will not cross-talk with each other more than before.

Electric Light Noise and Grounded Common Return.

We will soon have an electric light plant in running order here, and it is bound to give more or less trouble, as we have a grounded common return. Will some one please advise how to go at it to keep down the noise that is sure to come.

Make all lines in the telephone system metallic circuits. Until you can do this, clear your common return of grounds, and see to it that the return wire is near the center of the lead. Use repeating coils in cord circuits when connecting to grounded farmers' lines.

Cross Talk in Common Return Cable.

We have a 100-pair cable ten blocks long, which cuts into a 400-pair cable at one end, and into two 25-pair cans and a 50-pair cable at the other. The latter feed out in open wire leads. At one time we worked the 84 telephones of this end of town on a common return system. We cut everything metallic, but having now filled our cable capacity, we are cutting back to the return. We have 25 telephones cut over and the cross-talk is so bad that they can hardly be used. It is as if all were talking on the same line. I have soldered all joints of the return to the office, but it cross-talks as bad as ever. The cable shows no dampness. I know that it is impossible to eliminate all cross-talk, but this acts like a high resistance ground. The common return tests clear, and has no break. If it were broken, the telephones beyond the break would ring crossed. The cross-talk is about three times as bad with these 25 telephones as when we were carrying a load of 84. What is the cause?

The fewer telephones connected to one common return the worse will be the cross-talk. If you have enough telephones you can cut the return entirely and have no cross rings, and no more cross-talk than usual. This is because with a few telephones the little current which does not return by the wire leaks through each of the other telephones. But when there are many, it divides up into such small parts that each telephone does not get enough to be harmful. But why go back to common return if you have once been metallic? It is true that cable costs money, but poor service often costs more, and you may lose in the long run.

TO WIRE CHIEFS AND MAINTENANCE MEN.

Clearing of troubles which occur in your exchange, inside or outside, may be made the subject of short, practical letters which will interest other telephone men These TELEPHONY *will gladly publish, if illustrated by diagrams or photographs. Simply write a description of the nature of the trouble, tests and location, cause found, and method of repair. Payment will be made for all letters published.*

Telephone News

INDEPENDENT TELEPHONE CONVENTIONS

Arkansas, Little Rock, May 10,11; Indiana, Indianapolis, May 12, 13; Missouri, Kansas City, May 19, 20; West Virginia, Parkersburg, May 27, 28; Mississippi, Jackson, June 11, 12.

Steady Growth of Union Telephone Company, of Alma, Mich.

One striking peculiarity of the telephone business, as it exists to-day, is its increasing hunger for new capital. The public has learned that this condition exists, and rates the expenditure of the new funds, year by year, in a rough way by a comparison of directory lists. The Union Telephone Company, of Alma, Mich., is one of the companies having a financial record which shows that the meeting of the peculiar needs of the business by the sale of new capital every year leads to a healthy condition, and guarantees the security of all investments, while it provides the community with the additional facilities required. In its annual statement for the fiscal year 1908-9, it furnishes figures showing the steady growth of outstanding capital, gross earnings, and undivided profits, year by year, from March, 1902, to March 1909. In 1902, gross earnings and undivided profits were, respectively 17.1 and 2.7 per cent of the capital. After seven years, during which the capital was increased from $238,848.50 to $675,000 and a total of $280,607.12 was paid out in dividends, gross earnings were at the rate of 24.3 per cent on the present capital, and undivided profits had relatively improved to 12.5 per cent of the capital.

Following are some interesting abstracts from the annual report:

"The general dull times, coupled with unusual local conditions, have caused a slight decrease in the number of telephones in a few exchanges, but this was more than offset by gains in others, and leaves a net gain of 456 telephones for the year. The company made no effort to get new rural subscribers, but has taken care of all desirable business offered in exchanges where rural lines had previously been built. The demand for telephone service has become almost universal in the rural districts and the furnishing of such service has become a perplexing problem. The company has done much to assist the farmers in organizing co-operative companies for the purpose of building lines to connect with our toll stations. While this method of rural development has some objectionable features, it seems to be the only safe solution of the problem. This plan is meeting with much favor among the farmers and in most cases has worked out to the satisfaction of all concerned. During the past year we have made contracts with 13 new rural companies, making a total of 45 companies with 1,977 telephones in service. These, in addition to the (8,598) telephones on our own lines make a grand total of 10,595 telephones connected with the toll stations of this company.

"In addition to keeping the plant in first-class condition, the exchanges are constantly being improved and brought to a higher standard of excellence and efficiency. Many improvements and additions have been made to the St. Johns exchange the past year. The pole lines have been re-built, over 25,000 feet of new cables have been put up and the latest improved system of can top distribution installed throughout the city. New quarters were secured for the central office and a new switchboard of the latest type and highest efficiency has been installed. This plant is now furnishing ideal service to its 711 subscribers and has cable capacity for as many more. In addition to furnishing better and more reliable service, the new equipment will very materially reduce the cost of maintenance. A new all cable plant has recently been built at Farwell, and 62 telephones have already been installed. In addition to this the farmers have built and connected several lines, making an exchange considerably larger than what the opposition had at the time we started to build.

"Several important additions have recently been made to the long distance system of this company. A new No. 10 copper wire circuit was put up between St. Johns and Lansing to take care of the increasing traffic between those two important points. Another No. 10 copper circuit has been completed between Farwell and Auburn, a distance of 51 miles. This line terminates at Bay City on the east and Reed City on the west, and affords quick, efficient service between the Saginaw Valley and all points in the northwestern part of the state. A new No. 10 iron circuit was added between Farwell and Clare as an outlet for toll business originating at the new Farwell exchange. A fine cedar pole line was purchased between Averill and Edenville and a new No. 10 iron circuit was put up between the latter place and Midland. The toll line system of the company now consists of 819 miles of iron and 1,049½ miles of copper metallic circuits, all of which are in first-class condition.

"The total gross earnings for the year were $164,259.28, a gain of $11,613.86 for the year. Truly a remarkable showing, considering the depressing effects of the dull times on nearly all lines of trade. The following statement shows the earnings and expenses for the year:

Income from Telephone Rentals	$118,615.71
Income from Toll Lines	49,899.09
Miscellaneous Income	744.48
Gross Income	$164,259.28
Operating Expense, Maintenance, etc.	95,599.69
Surplus for Stock	$ 68,659.59
Dividends Paid	54,000.00
Undivided Profits for the year	$ 14,659.59
Undivided Profit Account, March 1, 1908	70,049.00
Undivided Profit Account, March 1, 1909	$ 84,706.59

"The following comparative statement shows the capital stock, gross earnings, and undivided profit account on March 15th, 1902, 1903, 1904, and March 1st, 1905, 1906, 1907, 1908 and 1909:

	Capital Stock	Gross Earnings	Undivided Profits
March 15, 1902	$238,848.50	$ 40,892.89	$ 6,360.11
March 15, 1903	320,500.50	65,938.70	12,593.20
March 15, 1904	380,700.50	86,375.63	22,959.22
March 1, 1905	436,750.50	97,867.31	32,997.97
March 1, 1906	523,116.00	114,048.77	42,260.29
March 1, 1907	602,946.00	132,159.49	55,569.83
March 1, 1908	675,000.00	152,645.42	70,047.00
March 1, 1909	675,000.00	164,259.28	84,706.59

"The regular quarterly dividends at the rate of 8 per cent per annum on the capital stock were declared and paid during the year. These dividends amounted to $54,000.00, and made a total of $280,607.12 paid in dividends, since the organization of the company

"Nearly all of the Michigan Independent telephone companies report a good growth and satisfactory earnings.The Home Telephone Company of Detroit has installed a large number of telephones during the year and now has an exchange of over 12,000 telephones in service. The new Detroit exchange has already added much traffic to our toll

lines, and the business will continue to increase as the promptness and superior quality of our service becomes more generally known. The Valley Home Telephone Company has made remarkable strides during the past year and its future growth and advancement seems assured. The Saginaw City exchanges have been re-built and equipped with the most modern apparatus. A new exchange and general office building was erected, 147,000 feet of underground conduits and new central energy switchboards were installed in both exchanges. Saginaw now has one of the finest telephone plants to be found anywhere and is putting up a most vigorous campaign for new subscribers. The new directory shows a total of 3,000 telephones in service, an increase of 1500 in the past six months. The Citizens' Telephone Compar y is widely known as one of the most prosperous and progressive of the Independent telephone companies. During the past year it has made many extensions and improvements to its mammoth plant. The Lansing exchange has been re-built and equipped with the latest approved automatic switchboard and telephones. The many improvements and aggressive work being done at both Lansing and Saginaw will be of great and lasting benefit to the Union Telephone Company. The lines of this company terminate at both of these prosperous cities and any growth in their local independent exchanges will increase the traffic over our toll lines.

"The company has invested a large amount of money during the past two years in the construction of new toll lines. These new lines not only relieved the congested condition of traffic, but provided room for a large increase in business. The growth has been retarded somewhat by the general business stagnation, but the company is now in position to reap an abundant harvest from the wave of prosperity said to be due to arrive in the near future.

"You have just listened to a statement showing the splendid financial earnings of this company and have been told something about the fine condition of its physical property, but this report would be incomplete and your Secretary would fail in his full duty were nothing said in commendation of the untiring efforts of your able general manager and his faithful assistants in every line or activity and usefulness. Money will buy material and build plants, but it takes wisdom, tact and patience to organize and hold a harmonious force of employees that will be loyal to a corporation and work for its interests with fidelity, loyalty, and zeal. The personnel of the employees of this company has steadily improved. Our operators are more efficient and better disciplined; our inspectors and construction men are more zealous and painstaking, and our managers are more loyal and devoted to the company's welfare than ever before in its history. It is doubtful if any corporation ever had a more faithful lot of employees, all working for your interests as though they were their own."

The officers and directors of the Union Telephone Company are: President, C. T. Babcock, St. Johns; Vice-President, E. S. Wagar, Edmore; Secretary, L. L. Conn, Alma; Treasurer, G. S. Ward, Alma; General Manager, W. J. Melchers, Alma.

Board of Directors—Tod Kincaid, Owosso; Jas. P. Gibbs, Ithaca; J. H. Fildew, St. Johns; G. S. Ward, Alma; F. G. Thiers, Mt. Pleasant; S. E. Parkill, Owosso; E. S. Wagar, Edmore; J. T. Millman, St. Johns; C. T. Babcock, St. Johns; W. A. Bahlke, Alma; G. S. Aldrich, St. Louis; C. W. Gale, Owosso.

Reduction in Ohio Long Distance Rates.

On Friday of last week the United States Telephone Company announced that material reductions would be made in rates over its lines to various points and probably to all sections reached by it. This was followed on Saturday by a statement of reductions to certain points by the Bell companies. Their reductions are irregular, however, and affect places where competition seems to have been most fierce, although some other places are affected, as well.

Officials of the United States Telephone Company state that this action has been in contemplation for a year and that the step was taken for the purpose of stimulating business rather than to take business from competitors. James S. Brailey, Jr., stated that there is as good reason to believe that a reduction in rates will increase the business of a telephone company as in the case of any other enterprise. The railroad companies, he said, have increased their business where rates have been reduced from three to two cents a mile. The steel companies have profited by lower prices, and the same results ought to follow in the telephone business.

The company has recently completed several hundred miles of new copper circuits in Ohio, and is prepared to take care of more business. It is natural that it should make an effort to secure this business and no better way of doing it presented itself than stimulation in the way of lower prices. If the lines can be kept busy at reduced rates, there is more money for the company than if they are in use a half or three-fourths of the time at higher rates. As much was intimated in the announcement that was made regarding the action.

Officials of the company state that in Ohio alone connections have been made with 325,000 stations, while the Bell companies have but 175,000 stations. In addition the system connects with stations in Pennsylvania, West Virginia, Kentucky, Indiana, Illinois, Missouri, Michigan and several other states. There is no reason why much more business should not be developed from all this territory, and an effort will be made to bring it out. Schedules are now being prepared covering the territory reached by the United States Telephone Company's lines, and as soon as they are completed the extension of business will be sought in good earnest. The reduction in toll rates may amount to an average of 20 per cent.

Little has been said regarding the reduction made by the Bell companies and it is not known how extensive a territory will be covered with Cleveland as a center, but some of the figures are as follows: To Cincinnati, reductions from $1.50 to $1.10; to Chicago, $1.25 to 75 cents; to Detroit, 90 cents to 65 cents; to Toledo, 60 cents to 45 cents; to Dayton, $1 to 75 cents; to Bellefontaine, 80 cents to 65 cents. From Pittsburg rates have been reduced as follows: To Columbus, $1 to 75 cents; to Toledo, $1.25 to 90 cents; to Youngstown, 40 cents to 30 cents; to Dayton, $1.50 to $1.10. With Pittsburg as a center, it is stated, a reduction of rates will be made to all points as far north as Detroit and south to Ohio river points.

With figures named so soon after the announcement of the United States Telephone Company that a new schedule will be made, it would seem that there will be close competition between the companies for business. That there will be a stimulation in the long distance business goes without saying, for the wires will be used much more than they have been in the past at the higher prices.

It is hinted that rumors from Wall street of a merger of the telegraph and the Bell telephone interests had something to do with the readjustment of rates by the United States Telephone Company, but this is unlikely. The desire of the company to extend its business and reach wider fields is the more plausible reason. At the same time the officers must have known that the step would be followed by a counter proposition from their competitors to prevent the business from getting away from them.

Program for the Mississippi Convention.

For a young organization the Mississippi Independent Telephone Association is going ahead to break records. The intention of all concerned to make it a live factor in helping every Independent telephone man in Mississippi, and some of the neighboring states, is apparent in the program for the next convention to be held at Jackson, June 11 and 12. Following are the subjects for discussion, with the name of the contributor of the paper on each:

"Collecting of Rentals and Tolls," Mr. J. L. Peavy, Meridian; "Cable Specifications, Depreciation and Life," Mr. R. H. Polk, Memphis, Tenn.; "Legal Rights and Obligations," Mr. N. D. Smith, Jackson; "Future Legislation," J. O. Spotts, Meridian, and M. L. Shannon, Pontotoc; "Independent Telephone Situation in South as Compared with Ten Years Ago," Mr. W. H. Bryant, Mobile, Ala.; "Farmer Line Contracts and Rentals," C. Neely, Byhalia; "Building of Rural Lines," D. F. Eastman, Booneville.

Everybody will have a good chance to get into the meeting with his own ideas, and questions, and get posted on the best way to carry on his business by learning about the mistakes and successes of his neighbors.

The Association, in its official announcement, says:

"The most promising time in the history of Independent telephony in the South is now here. Plan for it. Bring your money-making and money saving ideas to exchange with others present. Bring your directors and stockholders. Get posted."

Of course the bulk of the time will be given over to business. But Mr. W. D. Smith, of Jackson, is preparing plans for a little merrymaking that—well, there's no use telling secrets.

The officers of the Mississippi association are: President, J. B. Shannon, New Albany; vice-president, D. F. Eastman, Booneville; secretary and treasurer, S. L. Pake, Tupelo.

Meeting of Michigan Traffic Association.

The first meeting of the Michigan Independent Telephone Traffic Association to be held since the last convention resulted in an effort to carry out some of the ideas brought forward in the convention. The meeting was held last week in Grand Rapids, and one of the first subjects to receive attention was that of issuing a coupon book which will work satisfactorily among all the Independent companies. S. E. Fisher, Detroit; W. J. Melchers, Alma; and C. E. Tarte, Grand Rapids, were appointed a committee to devise some plan. The matter of advertising Independent long distance service was also taken up, and W. S. Vivian was authorized to get samples and prices of calendars, to contain, among other things, the Shield of the Independent companies. The calendars are to be used by the Independent companies of the state as the beginning of an advertising campaign to make the long distance service better known.

The Michigan Managers' Association also held a committee meeting, and it was decided to hold the semi-annual convention this year at Muskegon, in the latter part of May, the exact date and program to be determined upon later.

Program of the Indiana Convention.

The fourth annual convention of the Indiana Independent Telephone Association will be held at the Claypool Hotel, Indianapolis, May 12 and 13, next week.

Following is the program:

WEDNESDAY, MAY 12—MORNING SESSION, 10 A. M.

Toll Line Clearing House—Annual meeting.

Committee Meetings.

Registration and Inspection of Exhibits.

AFTERNOON SESSION, 2 P. M.

Call to Order. Roll Call.

Address of Welcome—Hon. Crate D. Bowen, City Attorney, representing Mayor Bookwalter.

Response—A. J. Payton, Rockport.

Annual Address—Chas. S. Norton, President of the Association.

Reading Minutes of previous meeting, Reports of Officers, including a report from each of the District Vice-Presidents giving a detailed account of the conditions of the telephone industry and the work accomplished during the past year in their respective districts.

Appointment and Reports of Committees.

EVENING SESSION, 7:30 P. M.

Annual Dinner—Informal program.

THURSDAY, MAY 13— MORNING SESSION, 10 P. M.

Presentation of new business.

Address—"Telephone Laws and Legal Decisions," Hon. Thos. E. Davidson, Greensburg.

Address—"Elements of Stability in Independent Telephony," H. D. Critchfield, General Counsel, International Independent Telephone Association, Chicago.

SUBJECTS FOR GENERAL DISCUSSION.

"Proper Rate for an Exchange of 1,000 Subscribers," C. A. Phelps.

"Extent, Limit and Rate for Party Line Service," Thos. D. Sheerin.

"Records in the Maintenance Department," Jno. L. Hosea.

"Depreciation," E. L. Cline.

"Extensions Out of Earnings," Walter J. Uhl.

"Free County Service," W. F. Qualls.

"The Clearing House," J. W. Coffey.

"Public Pay Stations," John Moriarty.

"Systematic Collections," F. R. Strickler.

"Advertising," John E. Yarling.

"Manual vs. Automatic System," George Thorward.

"Discipline at the Switchboard," F. O. Cuppy.

"Systematic Inspection," F. J. Beaucond.

"Insurance, Liability and Fire." Hart F. Farwell.

"Systematic Auditing," E. H. Jenne.

"Corporation Records," N. G. Hunter.

"Getting Rid of Deadheads," J. K. Johnson.

"Ideal Franchise Conditions," Martin Umbach.

"Proper Rate for Rural Lines," H. B. Crandall.

Appeals and References.

Reports of Committees.

AFTERNOON SESSION, 2 P. M.

Election of Officers. Election of Delegates. Miscellaneous Business. Adjournment.

The following are chairmen of special committees:

John A. Moriarty, Indianapolis, chairman Committee on Entertainment.

John L. Hosea, Martinsville, chairman Committee on Reception and Registration.

J. A. Brown, Winchester, chairman Committee on Resolutions.

Jamestown, New York, Allows Increase in Telephone Rates.

On April 24th, the common council of Jamestown, N. Y., granted, by a vote of 7 to 5, the request of the Home Telephone Company for permission to raise its rates. This action followed a submission of a detailed statement of the necessity for higher rates, based upon the audit and appraisal by experts selected by representatives of the city, as reported in last week's issue of TELEPHONY.

Wisconsin Legislature Turns Down Anti-Competition Bill.

A bill providing, in substance, that new telephone systems should not be built in towns where there is already one telephone service, without the granting of a certificate of public

necessity by the Railroad Commission, failed to pass the Wisconsin Assembly when it came up for the final hearing on April 28. The final vote was 33 in favor, 48 against the bill.

A motion to amend the bill to provide for physical connection of competing systems had failed to pass prior to the taking of the vote on the bill as introduced.

Francis Dagger Not Connected with the Saskatchewan Telephone Department.

Through an oversight of our Canadian correspondent it was stated in last week's issue of TELEPHONY that Mr. Francis Dagger will have charge of certain extensions of the Saskatchewan Government telephone system. Mr. Dagger has not been connected with the telephone department of the Saskatchewan Government for several months. The work will be carried on under the direction of Hon. J. A. Calder and his deputy, Mr. S. P. Porter.

Sewer Diggers Break Telephone Cable.

The manager of a telephone exchange must take an interest in all sorts of projects for municipal improvement. A few days ago laborers working on a new sewer in an Illinois city, reached a conduit run while the manager was asleep, and, digging beneath the conduit, left it unsupported long enough to put a cable out of commission.

Letters on Practical Subjects

Cut-out on Account of Bad Fuse at Cable Box.

Subscribers on a two-party line in our magneto exchange repeatedly complained that at times they were unable to get "Central." The troubleman reported that on inspection he found nothing wrong, and could get "Central" from both telephones. We examined the line and cut-off relays, and gave special attention to the exchange connections, but complaints still found their way to the wire chief's desk. Finally a subscriber on this line complained that he could not get "Central," and said that unless the trouble was repaired at once the company could take out the telephone.

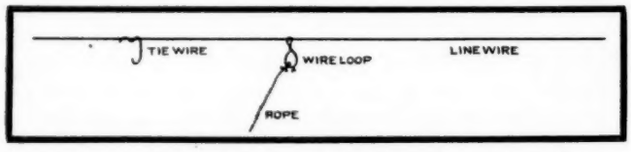
A visit was then made to the premises, and it was found that the operator could not be called either from the instrument itself or from a receiver across the binding posts of the telephone. The same condition was found on trying to raise the office from the house connections, and, finally, from the outside of the fuse at the cable box. Finally a call from the jumper side of the fuse was successful. Upon taking off my receiver clips, I noticed that the fuse wire was not soldered. This wire would make connection part of the time, but a slight movement of the pole would break the contact. We use a cartridge fuse, containing a 2 amp. lead alloy fuse wire. The cost of finding this trouble would have paid for the inspection of a good many hundred of these fuses where they are made.

New York. E. D. T.

Trouble From Loose Tie Wires.

For several months I have taken the precaution to look for and remove all loose tie wires found swinging loose on spans of line wire. In every case the line wire has been worn more or less; in some cases quite seriously. The number of loose ties found was very large, and they were swinging at many different places in the spans. Some were near the middle, some at splices, and others at the insulator.

It was not at all difficult to remove these tie wires. I made a small loop of No. 12 wire, around the line wire,



Device for Removing Loose Tie Wires from Line Wire.

and pulled it over the span by means of a hand line attached. This carried the tie wire to the pole, where it was easily removed.

I will also say that nearly every line break I had during last winter's sleet storms occured at the insulator, where the line had been worn almost in two by vibrating against the insulator. Proper tying would have prevented this.

Sabina, Ohio. Fred Ludlum.

A Recipe for Everyday Conduct.

I inclose a few sentiments which are especially pertinent to the telephone business and applicable to those engaged therein. It occurred to me the following might help some of TELEPHONY's readers who occasionally think there is more shadow than sunshine in their lives:

Let Us Smile

The thing that goes the
farthest towards making life worth while,
That costs the least and does the
most is just a pleasant smile,
The smile that bubbles from a
heart that loves its fellowmen
Will drive away the cloud of
gloom and coax the sun again,
It's full of worth and goodness, too,
with manly kindness blent—
It's worth a million dollars, and
doesn't cost a cent.

Must Heat Metals to be United for Good Soldering.

I was greatly interested in A. W. Reeves' "Agreeable Letter on Soldering Troubles," published April 24. His statement that the solder was "dropped on the joint" explains the whole cause of his failure. Solder will not stick to a cold metal surface. The metal to be soldered must be heated to the melting point of solder, and when this is done the metal to be soldered and the solder (aided by a flux), will quickly run together and stay there.

Tell Mr. Reeves to apply the hot copper to the joint, with a drop of solder adhering to it, and he will be surprised at the speedy amalgamation of the metals.

Without properly heating the joint, all the acids, resins, pastes, resin core solders, hard solders, soft solders and half and halfs, will prove dismal failures; but heat the joint to right degree, and any of them will succeed.

Vincent, Iowa. G. C. Anderson,
Manager, Vincent Telephone Co.

Telephone Patents

Conducted by Max W. Zabel

SELECTIVE TELEPHONE SYSTEM.

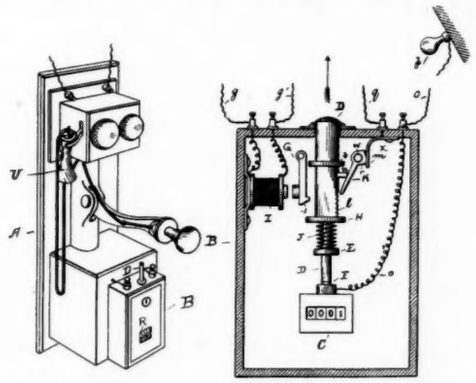
R. C. M. Hastings and T. Matheny, Athens, Ohio, patent 918,852, April 20, 1909.

This invention contemplates a step by step signaling arrangement in which the local stey by step arrangements are connected serially in the line circuit, and in which these step by step arrangements lock the several switch hooks of the stations not desired, and grounds the other side of the line in signaling. Various step by step and escapement mechanisms are utilized in carrying out these different features.

REGISTER FOR TELEPHONES.

Wm. O. Weissich, San Francisco, Cal., patent 919,662, April 27, 1909.

This registering device does not contemplate the use of coins, but when a registration is desired, the operator actuates the armature of the relay *I*, and authorizes the subscriber to depress the plunger *D*, which thereby contacts with a live terminal *F*, and apprises the operator, over



the circuit *o*, *q* that the subscriber has registered upon the dial *C*. Ratchet mechanism *l*, with a pawl *K*, normally prevent return of the plunger *C*, until it is depressed to its furthermost contact making position, in which limiting position, the lug *h* forces the pawl from the plunger *D*, and it so remains until the plunger *D* returns, when the plate *H* pushes it again into engagement with the ratchet. The armature *G* then engages the plate *H* upon its lower face, and prevents further registration until the operator again actuates the relay *I*.

NEUTRALIZING INDUCTIVE DISTURBANCES.

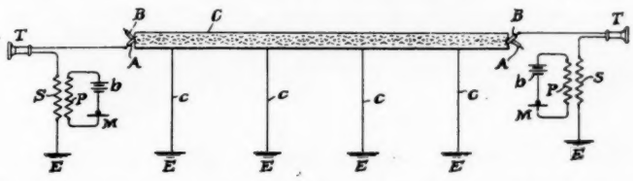
John R. Taylor, Schenectady, N. Y., patent 920,097, April 27, 1909; assigned to General Electric Co.

Means are disclosed and claimed in this patent for overcoming the inductive effect of trolley circuits on telephone or telegraph wires adjacent to the trolley circuit. The arrangement contemplates a plurality of series or current transformers in the trolley circuit, the secondaries of which are serially included in the telephone and telegraph circuit to counterbalance the inductive effect of the trolley. An adjustable resistance is shunted around each secondary winding, so that its effect can be adjusted to suit varying conditions.

ELECTRIC TRANSMISSION OF INTELLIGENCE.

Isidor Kitsee, Philadelphia, patent 918,666, April 20, 1909.

Increased transmission facilities are the result of the construction shown in this patent, it is claimed. The invention consists in connecting a telephone circuit at one end of a long distance system between the conductor *B* to ground, and at the other end, connecting the telephone between the conductor *A* and ground, and then grounding the sheath *C* at frequent intervals. The conductors *A* and *B* are associated only inductively, and not conductively.



This arrangement, it is claimed, overcomes self induction and capacity. The sheath *C*, it will be seen, serves as one conductor.

TELEPHONE APPARATUS.

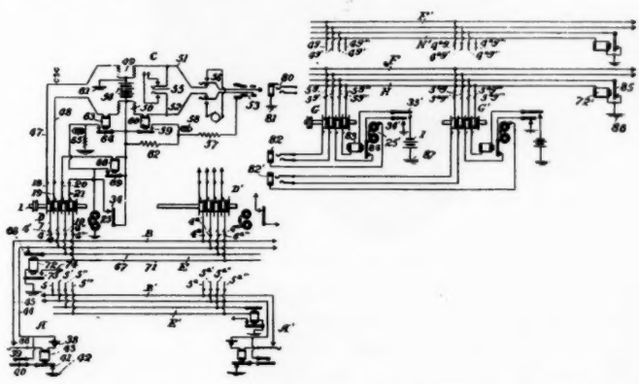
C. F. Bilton, Bridgeport, Conn., patent 919,812, April 27, 1909

A metal telephone cabinet of a particular construction is the subject matter of this invention. It consists of notched metal shells, the front plate of which has an outward bulge to receive the transmitter mouthpiece, and the interior periphery of this bulge is so arranged that it can receive directly the diaphragm of the transmitter.

AUTOMATIC TRUNKING APPARATUS.

L. O. Surles, Atlanta, Ga., patent 919,491, April 27, 1909.

This invention is designed to equalize the call upon cord circuits, and the diagramatic illustration here shown consists of two subscribers' stations, *A* and *A'*, which are connected by means of the conductors *B* and *B'* with contact making devices *D* and *D'*. Conductors 45 and 46 run between the central station and each subscriber's station. The rotatably mounted contact devices *D*, *D'*, are continually running, each one supplying a cord circuit, and whenever a subscriber removes his receiver from a switchboard, and places his line in a designed receptive condition, the movable device *D* of the cord circuit will finally contact with his terminals, and place the line in connection with a cord circuit *C*, as shown, after which the necessary interconnec-



tion may be effected. The patent also shows means whereby this system is applicable for automatic for other systems.

PARTY LINE SWITCHING APPARATUS.

A. J. Farmer, Detroit, Mich., patent 920,043, April 27, 1909.

This invention consists of interposing between the central office and several stations which are served from a

party line, a junction box for connecting in circuit any desired station or stations. The device essentially consists in sending a number of impulses, for selecting and then sending out the signaling current.

LIGHTNING ARRESTER OR LINE DISCONNECTOR.

Jesse W. Pedigo, Chariton, Ia., patent 919,069, April 20, 1909.

The lightning arrester of this invention is designed for mounting on the outside of a house, and has several arrester plates for taking off the discharge, and at the same time is designed, with a short circuiting switch which is operable from within the house, to cut out the telephone instrument during thunderstorms.

CLEARING OUT SYSTEM.

Klas Weman & T. S. Hemenway, Buffalo, N. Y., patent 919,409, April 27, 1909.

The arrangement shown in this patent contemplates the introduction of devices in a magneto cord circuit, to prevent ringing through and operating the bells on a party line circuit when an operator on a single line circuit, with which the party line may be connected, rings the disconnecting signal. To this end, a high resistance relay winding is bridged across the cord circuit, which, upon the first impulse, closes the circuit of a second or low resistance winding of the same relay, including therewith a local battery, at the same time bridging a low wound clearing-out drop across the cord circuit, which is designed to take all of the current. A switch is also provided to open the local circuit through the local battery and the low resistance winding.

GUY ROPE CABLE CLAMP.

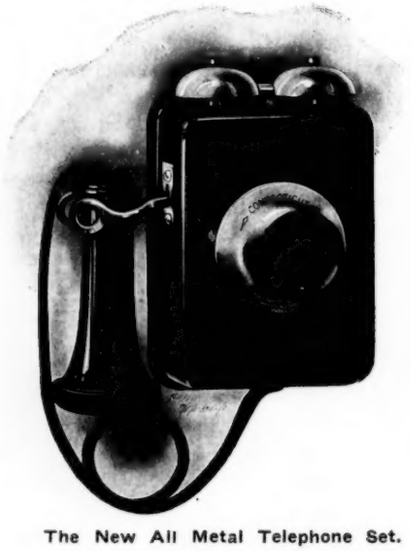
Louis H. Knapp, Syracuse, N. Y., patent 919,026, April 20, 1909; one-third assigned to W. E. Jenkinson, Syracuse.

A guy rope cable clamp is the subject matter of this invention, and consists of a body having two slots therein, which taper in opposite directions, the ends of the guy rope cable being placed one respectively in each slot, and each slot also serving to accommodate a wedge, which are forced into the slots and hold the cable ends in place.

In the Manufacturing Field

A New All Metal Telephone Set.

A new type of all metal telephone to be used in connection with hotel apartment and two-line interior telephone systems, has recently been placed on the market by the Connecticut Telephone & Electric Company, of Meriden, Conn. This telephone is designed principally for battery call service, but it can also be arranged for common battery exchange service. It is said to be equipped



The New All Metal Telephone Set.

throughout with fittings suitable for long distance service. All cord and line connections are made inside the case. The set is finished in black enamel with nickel trimmings, and presents an attractive appearance.

Drawing Wire From Bars.

"Wire, Its Manufacture and Uses" is the title of an interesting booklet issued by John A. Roebling's Sons Company, of Trenton, N. J.

In addition to mentioning some of the uses of wire in engineering work, its everyday use, such as in wire screens, springs, fences and other uses are mentioned.

"To produce wire for so many uses reqiures the treatment of a large number of metals, and varied processes of manufacture. In the early stages these processes are identical. Bars of metal, four inches square, are heated and passed while hot and plastic through rapidly revolving rolls, reducing them to wire rods which vary from one-quarter of an inch to an inch or more in diameter, depending upon the finished size of wire wanted.

"The rods, which are formed into coils as they pass through the rolls, are dipped in acid baths to remove loose scale and provide a lubricant for drawing. Drawing consists of pulling rods while cold through holes of gradually decreasing diameter drilled in steel plates. During this process the particles of metal become elongated and strained, making the wire harder and more brittle. To restore it to a proper temper, it is necessary to heat or anneal it.

"When a very fine diameter is required, there must be repeated annealing and drawings. This may be done until the bar, which originally was four inches square and four feet long, becomes reduced to a diameter of a single thousandth of an inch and extended 13,000 miles in length. Before so fine a size is reached the wire will cut into the steel of the die plate, so the usual die plates must be discarded and the drawing continued through holes drilled in diamonds, the diameter of these diamond dies decreasing by fractional parts of a thousandth of an inch. This wire affords a striking illustration of a material made more valuable by the application of labor.

"From the time the bar of metal enters the furnace nothing is added to it. All the work is done with one article which is passed through rolls and drawn through die plates until it is finished. The wire is made from an extra high grade of steel worth in the bar six cents a pound, which is much above the price of the greater bulk of steel. In the finished wire the value is increased from six cents to $50.00 a pound.

"The above is an extreme illustration but it will serve to show that in making wire many things affect the cost. First, there comes the metal, then the size, shape and finish of the wire; these depending upon the purpose for which it is to be used.

"Wire for fencing and the common grades of so-called market wire do not involve a high labor cost and sell at a small advance above the price of the metal bar. Other wires drawn for more exacting purposes sell at higher prices. Wire 1-1,000 of an inch in diameter is of course exceptional, being prepared for delicate electrical tests of such importance that it is deemed advisable to go to great expense to make it exactly the required size."

New Dean Toll Board for Lincoln.

The Lincoln Telephone & Telegraph Company, of Lincoln, Neb., has just ordered a six section toll switchboard from the Dean Electric Company. The contract includes complete terminal, power, and telegraphing facilities. The development of telegraph service, in connection with long distance telephone work, has been given special attention by Dean engineers, as is shown by the installations at Cleveland and Detroit, which were inspected by Mr. Geo. K. Gann, traffic manager of the Lincoln Telephone & Telegraph Company, at the time of placing the order.

The contract includes a two position chief operator's desk, a two position wire chief's test board, main and intermediate distributing frames, battery racks, repeating tables, and power plant complete. The board is to be equipped for sixty lines, with an ultimate capacity of well over that number. Service is provided by lamp signal, bridged multiple equipment, which Dean engineers have concluded to be the only satisfactory and reliable equipment for handling toll business. By this wiring all series contacts in the talking circuit are eliminated. Service is handled through a complete and solid metallic circuit, free from any complications whatsoever.

The new "Wade" exchange for the Cuyahoga Telephone Company at Cleveland, Ohio, has just been ordered of the Dean Electric Company. This is the largest single contract placed by an Independent operator since the Detroit Home Telephone Company ordered its mammouth equipment of the same manufacturer.

The exchange consists of ten common battery multiple sections with four additional sections comprising a "B" board. A capacity of 3,240 lines is to be installed for immediate service with an ultimate capacity and present equipment of 6,400 lines.

The order includes complete power and terminal facilities, as well as the necessary apparatus for Dean Harmonic selective party line service. The new exchange will relieve the over-load on the "Central" and "Crest" exchanges of the Cuyahoga Telephone Company.

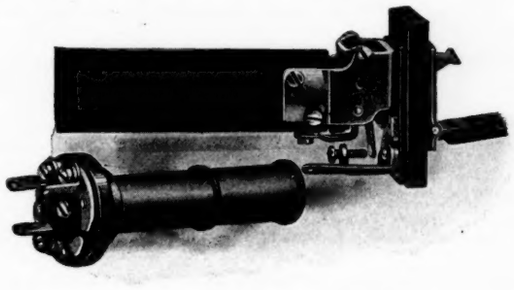
The company's Kansas City branch house has just closed the contract for a common battery multiple installation at Atlantic, Iowa.

The Musson Brothers have ordered two sections providing 540 common battery lines and 35 rural connections for this place. The order includes a chief operator's and monitor's desk a wire chief's desk the necessary terminal equipment and a complete power plant.

Equipment is all arranged for Dean Harmonic selective party line operation.

The Monarch Clearing Out Drop.

Each one of the cord circuits in the new switchboard for the Nortonville (Kans.), Telephone Company, is to be equipped with bridged and series clearing out drop and lamp recall signal. The system is one of those developed by the Monarch Telephone Manufacturing Company and the illustration shows a Monarch clearing out drop of the type selected. The double winding of the coil is shown as is also the relay contact which closes the lamp circuit. A ½ M. F. condenser forces a ring-off through one of the windings of this coil, and, as either winding operates the drop, the shutter must fall. If the operator neglects to restore the shutter, the ring, if repeated, will pull up the armature and by means of the relay contact close the lamp circuit, thus lighting the lamp. With this system every ringoff signal is sure to reach the board, and the lamp



The Monarch Cleaning Out Drop.

makes it easy for a person to attract the operator's attention, even if she neglects to restore the shutter.

The mechanical means provided for the operation of the local circuit for the lamp is most ingenuous as it makes a positive contact and one that can be depended upon. This is done without putting any extra work on the armature. This system is completely described in Bulletin No. 5 issued by the Monarch Telephone Manufacturing Company of Chicago.

Julius Andrae & Sons Company in Larger Quarters.

On May 1, Julius Andrae & Sons Company moved into a high class modern building at 118 to 120 Sycamore St., Milwaukee, Wis. This firm has had a continuous growth for the last 50 years, until at present it ranks high among electrical supply houses. Its business in telephones, switchboards and supplies has been steadily growing, until now in addition to doing a large business direct from headquarters, the company reports that it has nine telephone salesmen on the road and is doing business all over the United States, as well as in Canada, England and other foreign countries.

The officers of the company are Julius Andrae, Sr., president; J. C. Schmidtbauer, vice-president; F. T. Andrae, secretary; and H. P. Andrae, treasurer.

A Large New Creosoting Plant.

The Kettle River Quarries Company has just completed a big creosoting plant at Madison, Illinois, which occupies 44 acres of ground, is provided with 24,000 ft. of railroad tracks throughout the big yards, and is equipped to treat 50,000,000 board feet of timber annually.

A description of the new plant is contained in an interesting booklet "Modern Creosoting" which is being distributed from the company's general offices at Minneapolis, Minn. The company has sales offices at 1033 First National Bank Building, Chicago, Ill., and 508 to 512 Pierce Building, St. Louis, Mo.

THE BULLETIN on rural telephone line construction (No. 45) recently issued by the Kellogg Switchboard & Supply Company, Chicago, Ill., will prove of interest at this time to telephone men. It is carefully illustrated, showing the best practice in setting poles, guying, bracing and wiring, explaining the different wind and other strains, and the importance of careful guying; gives transportation chart views of the most approved transportation brackets; insulators, arms, arm braces, etc. Tools required in line and telephone work and costs are listed, also the forms and contracts, constitution, by-laws and rules of order generally used by farm companies.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. B. PARSONS, of Valley City, N. D., has been made manager of the Griggs County Telephone Company at Cooperstown, N. D.

NEW COMPANIES.

RAUM, ARK.—The Northern Arkansas & Missouri Telephone Company was recently organized at this place. Mr. A. Winkle has been chosen president, W. O. Fox, secretary, and T. J. Davis, treasurer.

CUTHBERT, GA.—C. J. O'Farrell, Jr., Clark county, and J. G. Dean and J. M. Bell, Terrell county, have filed articles of incorporation for the Cotton Belt Telephone & Telegraph Company with a capital stock of $21,000. They desire a franchise for 20 years and intend to establish lines in the city of Cuthbert and in such other places in the state as may be desired later.

GRANGEVILLE, IDAHO.—The Whitebird Telephone Company has been organized to build a mutual line from Whitebird to Grangeville, where connections will be made with the lines of the Nez Perce Co-Operative Telephone Company.

POCATELLO, IDAHO.—With Thadeus S. Lane, H. R. Risley, Frank R. Frost, D. W. Standrod and Irving Whitehouse as organizers, the Idaho Independent Telephone Company, of this place, has been incorporated. The capital stock of the new company is reported at $1,000,000.

CHICAGO, ILL.—The Kendall County Telephone Company, 205 La Salle street, Chicago, has been incorporated with a capital stock of $25,000, to operate throughout Kendall county. The incorporators are, M. Lester Cofeen, F. W. Henickman and G. T. Rogers.

GOLDEN, ILL.—The Golden Farmers' Telephone Company has been incorporated with a capital stock of $3,500. The incorporators are Philip Cain, Scott Taylor and D. G. Buss.

LOVINGTON, ILL.—The Farmers & Merchants Telephone Company of Moultrie county has been incorporated. The capital stock is $30,000 and the incorporators are, William C. Neff, William O. Rood and Arthur E. Hanson.

BRUSHY PRAIRIE, IND.—The Farmers' Mutual Telephone Company has been incorporated to build and operate a telephone system in this place and LaGrange county. Arthur J. Hammond, E. W. Ernsberger and Fred Seaburn are the directors.

KOKOMO, IND.—The John R. Goyer Telephone Company has filed articles of incorporation with John R. Goyer, Joseph Hessler and O. A. Clark as directors. The object of the company is to build and equip an exchange and to connect with other telephone lines in the county of Howard.

DYERSVILLE, IA.—The Lumemburg & Millville Telephone Company has been organized to build and maintain a telephone system throughout Dubuque county. The officers are: President, Otto Andreogg; vice-president, Peter Henkels, and secretary-treasurer, George Friedman. It is expected that the Millville line will be in operation about May 1.

EDGEWOOD, Ia.—The Edgewood Farmers' Telephone Company has been organized with a capital stock of $2,000 by farmers living in this vicinity. The officers are: R. L. Phelps, president; J. A. Stone, vice-president; J. S. Wait, secretary, and U. G. Elliott, treasurer.

LELAND, IA.—The Leland Mutual Telephone Company has been incorporated by E. G. McGreery and W. R. Buren. The capital stock is $5,000.

PORTLAND, IA.—The Portland Heights Telephone Company has recently been incorporated. Its capital stock is $10,000 and the officers are: President, E. L. Bitterman; vice-president, R. B. Pickford; secretary and treasurer, Arthur Pickford.

PORTLAND, IA.—The Portland & Cameron Telephone Company of Cerro Gordo county has been incorporated. The capital stock is $5,000 and the incorporators are F. N. Dunn, F. A. Hill and P. M. Johnson.

MINA, MAN.—The Mina Telephone Company has been organized with L. B. Detweiler as president, Wm. Burton, secretary, and Peter Godbout, treasurer.

CHOKIO, MINN.—With a capital stock of $2,000, the Chokio Telephone Company has been incorporated by A. F. Reidner, Charles McAllen, James McNally and others.

FERGUS FALLS, MINN.—The farmers residing to the north of this city have incorporated the Fergus Falls Rural Telephone Company. Max J. Kronnemn is president and George Kelley secretary. Many lines will be constructed this season.

FLORENCE, MISS.—A local telephone company has been organized with Dr. R. N. Whitfield, president and general manager; A. P. Dear, vice-president, and Joseph J. Flowers, secretary-treasurer.

HINSDALE, MONT., (Valley County)—The Farmers' Telephone Company has organized to build and maintain a farmers telephone system in this vicinity. The company is capitalized at $20,000 and its principal office will be in this place.

CLAY CENTER, NEB.—J. R. Shawcross, A. Batterman, H. B. Francisco and E. A. Holt have filed articles of incorporation for the Glenville and Inland Telephone Association. The object of the company is to conduct a general telephone business, including the power to construct, lease, buy and sell telephone lines and systems and to conduct and equip a system in Clay county, Nebraska. The capital stock is $10,000.

ELIZABETH, N. J.—The Mutual District Telegraph and Telephone Company has been incorporated to operate telegraph and telephone lines. The incorporators are Joseph A. McClary, of Rahway, N. J.; George W. Blanchard and Henry W. Pope, of New York, and others. The capital of the company is placed at $100,000.

SELMA, N. C.—The Selma Telephone Company has been incorporated with a capital stock of $5,000 by T. H. Atkinson, of Washington, D. C., L. H. Allred, of Selma, and others. The company has a franchise to build rural telephones in the Selma district.

BURLINGTON, N. D.—The Burlington Farmers' Telephone Company has been incorporated with a capital stock of $25,000, by the following incorporators: William J. Culver, Henry A. Parrie and Daniel Baker.

KULM, N. D.—The Swede Township Telephone Company was recently incorporated by G. H. Davidson, Jacob Bjur, R. Ogren and others of this place with a capitalization of $5,000.

LINTON, N. DAK.—F. E. Kaiser, H. C. Batzer, A. L. Geill and others, have filed articles of incorporation for the Emmons County Telephone Company. The capital stock is $4,200.

MANDAN, N. DAK.—P. B. Wickham, of Glen Ullin, W. F. Berrier, Flasher, and Wm. Simpson, of Mandan, have incorporated as the Southern Morton County Telephone Company, with a capital stock of $25,000.

ADDINGTON, OKLA.—The Jefferson County Telephone Company has been organized and incorporated with a capital of $1,500. The incorporators are R. M. Golden, J. P. Garretson, E. M. Bond, J. W. Moore, J. L. Evans and A. J. McNeill.

McARTHUR, OKLA.—The McArthur Telephone Company has been incorporated with a capital stock of $3,000. Henry Black, John Rogers and C. H. Godfrey, all of Texmo, D. Stalford and B. H. Potterfield, of Harmon, are the incorporators.

MEDFORD, ORE.—The Citizens' Telephone Company has been incorporated by E. P. Pickel and others with a capital stock of $30,000.

SELMA, ORE.—The Deer Creek Valley Telephone Company has been incorporated with a capital of $1,500 and E. Hathaway, J. W. Baird and T. H. Harmon as incorporators.

INDIANA, PA.—A branch of the Farmers' Telephone Company has been formed at Marion Center, with a view to improving service in that vicinity. C. R. Griffith is president; S. J. Mains, secretary-treasurer, and J. C. Bovard and J. D. Rowland, directors.

LANCASTER, PA.—The Intercourse Telephone Company was recently organized and at the meeting the following officers were elected: President, W. J. Daldwell; vice-president, John M. Beam; secretary, H. M. Klingler. The company is capitalized at $5,000.

PIERRE, S. D.—A new telephone company has been organized here for the purpose of constructing and maintaining a line from Little Bend to Onida. The officers are H. P. Knox, Little Bend, president; W. E. Jenkins, Okobojo, secretary; M. L. French, Onida, treasurer.

WASTA, S. D.—R. E. Huddleston, John Asheim and Dan Shine of Elm Springs; Frank Cottle, of Smithville; Charles B. Hunt of Wasta, have organized the Elm Springs and Wasta Telephone Company. The capital stock is placed at $10,000. The company will build a line from Wasta to White Owl, a distance of about fifty miles, taking in Smithville and building a branch to Elm Springs.

WOODBURY, TENN. (Cannon county)—The Home Telephone Company has been incorporated with a capital stock of $5,000. The incorporators are Jesse Davenport, L. H. McCrary, J. P. Wood, Walter Hancock and others.

COPPERAS COVE, TEX.—Citizens of this place and Topsey have organized a telephone company with C. W. Clements as president.

CHARLES CITY, VA.—A telephone company to be called the Charles City Telephone Company has been organized. H. S. Saunders is president; L. M. Nance, treasurer, and J. M. Bell, sec-

retary. Sufficient stock was subscribed to warrant the lines being built and construction will begin at Roxbury Station.

DANVILLE, VA.—The Providence Telephone Company has been incorporated with a capital stock of $5,000, by C. B. Flinttop, Danville; D. G. Wilkins, Blanche, N. C., and others.

NORTH YAKIMA, WASH.—The Moxee Telephone Company has recently been organized. The company is capitalized at $10,000, and incorporators are, Arthur Champoux, Emil Allwardt, Charles A. Schmidt and John Wayenberg.

FINANCIAL.

WALLACE, IDAHO.—The North Idaho Telephone Company has increased its capital stock from $25,000 to $100,000, and at the same time declared a dividend of $2,500 on the former capital. The company is in an exceptionally healthy condition, and it is hoped that a steady dividend of 5 per cent a year can be declared in the future.

LAWTON, IA.—The Lawton Telephone Company has increased its capital stock from $3,000 to $9,000.

HARDY, NEB.—The Hardy Independent Telephone Company held its annual meeting recently and re-elected its directors, who have served since the organization. A 12 per cent dividend was declared.

RENSSELAER, N. Y.—The Rensselaer Telephone Company has secured a loan of $75,000 from the Troy Trust Company, to be used in the construction work which has been under way for some time.

FRANCHISES.

PATTERSON, (Ohio County), W. VA.—The National Telephone Company of West Virginia has been granted a franchise for fifty years to construct and maintain its poles, wires, cables and fixtures on the streets and underground.

CONSTRUCTION.

MESA, ARIZ.—The Independent Telephone Company has been granted a franchise and will now make extensions and improvements throughout this place. A new switchboard having a capacity of 450 lines has been ordered. The lines will be run in the alleys as far as possible. Practically all of the material needed has been ordered.

PHOENIX, ARIZ.—The Consolidated Telephone Company has expended about $8,000 in material for the improvement and extension of its system. New wall telephones will replace the old ones and all are to be equipped with lightning arresters.

GALESBURG, ILL.—The Union Telephone Company is planning extensive improvements to its lines this season. They will soon begin the construction of a new copper wire from Galesburg to Quincy, and in addition to this several miles of new wire will be strung in the city. A new switchboard is to be installed, the one now in use having outgrown its capacity. More sections are to be provided for toll service, as the number of towns with which the company is connected has grown so much that it is made necessary. A new switchboard is also to be installed by the company in its plant in Knoxville and the entire town to be recabled.

PAYSON, ILL.—The Payson Farmers' Telephone Company has ordered a new switchboard, which will be installed within a short time. It was made necessary on account of the increase in subscribers, and will be greatly appreciated by all the patrons.

HAZELTON, IND.—The Hazelton Telephone Company is making arrangements to entirely renovate its exchange. A new switchboard is also to be installed soon.

LAND, IND.—The local exchange of the Farmers' Mutual Telephone Company has been remodeled and a new switchboard installed.

MICHIGAN CITY, IND.—The Merchants' Mutual Telephone Company is considering the proposition of building a toll line from this city to Grand Beach Springs, as there is quite a demand for service at this place.

OSKALOOSA, IA.—The Home Telephone Company is making preparations to place all the telephone lines in the business district underground, and the wires running along the Iowa City road will be placed in cables, also all the wires in the residence district. The line capacity is to be practically doubled so as to take care of the increase for years to come. Rural service is all to be made metallic. The improvements will cost about $50,000.

TOLEDO, IA.—The Commercial Telephone Company has received 3,000 feet of cable for the rebuilding of its lines in the business district. Part of the cable is to be placed underground. The improvements will cost about $2,000.

WAVERLY, IA.—The telephone system of the Corn Belt Telephone Company in this place is to be entirely reconstructed. All of its lines will be placed underground, which will require about 15,000 feet of conduit, and all poles are to be placed in the alleys. The exchange is to be fitted up with a new modern switchboard and other equipment. New instruments are to be installed and no old material will be used.

CIRCLEVILLE, KAN.—The Circleville Independent Telephone Company has just installed a new 150 drop switchboard with associated lightning arresters and connecting rack. It has long distance connections with Topeka and Kansas City and with the improved service will soon add new business. A prosperous year is anticipated under the management of Mr. J. W. Evans.

POTTER, KAN.—The Potter Telephone Company is preparing to rebuild its entire system in this place.

MONROE, LA.—The Home Telephone Company is making many improvements in its present telephone system. The stringing of cables has just been completed, and the company has placed all its poles in alleys, so far as possible. The installation of the new common battery switchboard will now be commenced.

KEKOVEN, MINN.—The lines of the Valley Telephone Company will be extended to Lake Johanna.

TRACY, MINN.—The Tri-State Telephone Company is making preparations to extend its line to Marshall.

SEDALIA, MO.—It is reported that the Home Telephone Company will make many improvements in West Sedalia. The open wires are to be replaced by cables at a cost of nearly $5,000. The company now has an excellent system and with the improvements will be practically unexcelled in this section of the country.

LEWISTON, MONT.—The Independent Telephone Company is constructing a line to Great Falls.

BEAVER CROSSING, NEB.—The Seward County Telephone Company has placed orders for new equipment for its various exchanges. Tamora is to have a new 100 line board and Utica a new 300 line board. This company is in good shape financially and its stock is in great demand. It now operates eight exchanges.

GERING, NEB.—The Platte Valley Telephone Company intends moving all its poles and wires to the alleys and will use about 8,000 feet of cable in this work.

GOTHENBURG, NEB.—The Gothenburg Telephone Exchange has placed an order for a 1,000 line magneto multiple switchboard, to replace the old equipment.

LINCOLN, NEB.—The Lincoln Telephone & Telegraph Company has ordered five carloads of cable.

NORFOLK, NEB.—A toll line will be constructed to Humphrey by the Norfolk Long Distance Telephone Company.

PLATTSMOUTH, NEB.—The Plattsmouth Telephone Company is rebuilding its system in this place. Orders have been placed for a car load of cable.

SOUTH OMAHA, NEB.—The Independent Telephone Company is making arrangements to erect an exchange building.

ATLANTA, N. Y.—It is reported by B. M. Boothe, manager of the Independent Telephone Company, that another line is being constructed from this place to North Cohocton.

BUFFALO, N. D.—The Dakota-Montana Telephone Company is making arrangements to build a line from this place to Scranton, likewise one from Belle Fourche to Buffalo.

DUNSEITH, N. D.—The Northern Telephone Company intends constructing a line from this place to Kelvin.

LARVIK, N. D.—(P. O. Westfield)—The Emmons County Telephone Company is planning to build several rural lines in this county.

BOWLING GREEN, OHIO—The Tontogany Telephone Company is busy reconstructing its lines, replacing the old poles with new ones and stringing new wires.

CLEVELAND, OHIO.—The directors of the Cuyahoga Telephone Company have authorized the building of a new exchange building on East Eighty-first St., to cost about $100,000. The exchange will have a capacity of about 7,000 telephones, making a total of about 35,000 for the company's entire system. The company has, of late, been compelled to refuse at least 1,000 orders for telephones on account of the lack of facilities to provide for them. This exchange will greatly improve the service of East Cleveland. The orders for cable and other construction material have already been placed.

DAYTON, OHIO.—The Home Telephone Company will expend about $200,000 on improvements and extensions this summer. Five new sub-stations are to be installed, viz., Riverdale, North Dayton, The East End, Oakdale, and the West Side, each to have distinct stations with connections to the main office. The present system is very heavily taxed and new telephones can not be added until the new exchanges are completed.

BETHEL, PA.—A new telephone line will be built from Straustown to Bernville by the Mt. Aetna & Bethel Telephone Company.

CONNEAUTVILLE, PA.—The telephone company of this place is moving into its new quarters and a new switchboard and new cable system will be installed and other improvements will be made.

GAFFNEY, S. C.—The Piedmont Telephone Company is making arrangements to extend its lines into the country. One line will be run to Macedonia and one to the Thickety neighborhood. Wilkinsville people are also taking steps to have a line extended to their section.

COLTON, S. D.—The Colton Telephone Company is contemplating many improvements to the system this season.

NANSEN, S. D.—(P. O. Howard)—The Nansen Telephone Company is contemplating extensions and improvements to its lines this season.

GONZALES, TEX.—The Gonzales Telephone Company is stringing cable in the southwestern part of the city. The company now maintains about 600 telephones.

LONGVIEW, TEX.—The Lacy Telephone Company is making arrangements to run a farmers' line into the northeast section.

HUMUM, WASH.—The Underwood-Norway Telephone Company will soon begin the construction of an extension of its line into the Little White Salmon country, in Skamenia county.

ELECTIONS.

WRAY, COLO.—Officers have been elected to serve the Wray Telephone Company for the ensuing year as follows: C. C. Vennum, Stratton, Neb., president; W. D. McGinnis, Wray, vice-president; E. B. Borland, Wray, treasurer; A. H. Thomas, Trenton, N. D. Beaver, Wray, directors, and A. H. Borland, secretary and general manager.

HAZELTON, IND.—The Hazelton Telephone Company held its annual meeting recently and elected the following officers to serve for the ensuing year: C. F. Stevens, president; W. C. McFetridge, vice-president; W. A. Barnett, secretary; H. M. Arthur, treasurer; James B. Robb, Jr., Aaron Trippet, Sr., Lucius Armstrong and C. L. Howard, directors.

SOUTH BEND, IND.—The South Bend Home Telephone Company held its annual meeting recently, and officers and directors were elected as follows: Joseph Harris, S. F. Harris, C. C. Wheeler, H. A. Harris, Albert E. Wilson, Walter I. Patton of Chicago; John A. Herzog, Mishawaka; Charles T. Lindsey, Marion B. Staley, Elmer R. Stoll, Demas D. Bates, Horace Greeley Miller and Theodore Thorward, of South Bend. The officers are: Theodore Thorward, president; H. G. Miller and M. B. Staley, vice-presidents; E. R. Stoll, secretary and assistant treasurer; Sanford F. Harris, treasurer, and W. I. Patton, auditor.

FAIRMONT, KAN.—The Sunflower Telephone Company has elected the following officers to serve for one year: Wallace Jackson, president; A. J. Cantwell, secretary and treasurer.

OSBORNE, KAN.—At the recent annual meeting of the Osborne-Cheyenne Telephone Company, the officers elected to serve the company are: Levi Vague, president; Albert Smith, vice-president; John Doane, secretary; E. H. Cobb, treasurer.

BRANT, MICH.—Officers elected to serve the Brady and Brant Rural Telephone Company are: Oliver McFall, president; John Thompson, vice-president; C. E. Proper, secretary; Nathaniel Crane, treasurer, and William Nixon, director.

CULBERTSON, MONT.—The stockholders of the Montana Star Telephone Company met recently and elected officers and directors as follows: President, G. W. Tanner; vice-president, H. M. Cosier; treasurer, I. O. Slette. These with L. L. Brooks, R. E. Patch, Wm. McBride, C. Johnson, L. L. Brink and Peter Marron constitute the board of directors.

GREELEY, NEB.—The Central Telephone Company held its annual meeting and W. E. Reed was elected president; J. J. Maginn, vice-president; M. F. O'Malley, secretary-treasurer. The directors are J. W. Schweer, I. R. Swain, P. J. Rooney, Dr. J. L. Brannen, F. H. Clough, W. E. Reed and J. J. Maginn.

ELIZABETHTOWN, N. Y.—The annual meeting of the stockholders of the Lewis and Elizabethtown Telephone Company was held recently and the old board of directors was re-elected with the exception of Wm. H. Marshall, who takes the place of E. W. Marshall.

NEW RIEGEL, OHIO.—The New Riegel Mutual Telephone Company met recently and elected officers and directors as follows: President, A. A. Brant; vice-president, G. C. Gase; secretary, Dr. R. B. Miller; treasurer, Albert Adelsperger; manager, Ignatius Lenhart. Directors, Jacob Lafontaine, J. B. Clouse, J. B. Wonderly.

BARLOW, PA.—The Barlow Telephone Company, recently organized, has elected officers as follows: President, J. Kerr Lott; vice-president, F. S. Cromer; secretary, Howard T. Maring; treasurer, Wm. H. Cromer.

CANTON, S. D.—The newly elected directors and officers of the Canton Co-operative Telephone Company are: C. B. Kennedy, Thomas Thorson, H. N. Cooper, Arthur Linn and John Anderson. President, C. E. Kennedy; vice-president, Thomas Thorson; secretary and manager, D. S. Waldo.

JEFFERSON, S. D.—The Broken Kettle Telephone Company has elected officers for the ensuing year as follows: President, H. G. Codd; secretary-treasurer, Oscar Nystrom; manager, J. H. Mason. Fred La Breche, W. E. Mason and H. G. Codd are directors.

BENTON, WIS.—At the annual meeting of the Benton Telephone Company the following officers were elected: President, J. E. Allen, vice-president, George Wilkinson; secretary and treasurer, W. R. Buchan; directors, Geo. Wilkinson, T. A. McCarthy and Frank Rispin.

JUNEAU, WIS.—Officers for the Juneau Telephone Company have been elected as follows: Peter Peters, president; M. Sette, secretary, and T. A. McCollow, treasurer. The company is in excellent condition.

MISCELLANEOUS.

PRINCETON, IND.—The Princeton Independent Telephone Company has asked the town council of Owensville for a permit to erect poles within the town limits for a direct line to Owensville from Princeton. This direct line would greatly facilitate the present service between the two places over the Independnt system, as heretofore it has been necessary to go through several small exchanges. As soon as the permit is granted, Manager Parrett of the Princeton company will purchase material for the new line.

TOCSIN, IND.—David and Andrew Worling have purchased control of the Tocsin Telephone Company of Tocsin, and the Craigville Telephone Company, Craigville, Ind. These two systems have been owned and operated since their organization about four years ago, by Henry Plummer and Kelley Brothers. Mr. William Tennison, of Fort Wayne, Ind., will take charge of the exchanges. In Craigville many improvements will be made, new equipment installed and some extensions made. In Tocsin, the company has bought the old school building, which will be fitted up for an exchange.

JEFFERSON, IA.—The Citizens Mutual Telephone Company is in a flourishing condition. Increase in business made it necessary to install a new switchboard having a capacity of 100 more drops than the old board.

HILLSBORO, KAN.—John Daede has sold his telephone business to J. C. Jansen for $7,000. Mr. Jansen took charge immediately on the completion of the transaction. The exchange will be moved into the new building he is having erected for the purpose. He plans to make numerous changes and improvements.

COLUMBIA, MO.—The Columbia Telephone Company has completed a new toll line from Columbia to Murray.

ROGERSVILLE, MO.—Fire recently destroyed the office building of the Rogersville Telephone Company.

BLADEN, NEB.—The Bladen Rural Telephone Company has consolidated with the Glenwood Rural Telephone Company. The change will be made July 1.

COLUMBUS, NEB.—Messrs. Charles A. and S. B. Gregg, of Mt. Pleasant, Ia., have purchased the interests of T. J. Cottingham and G. T. Everett in the Platte County Telephone Company. Charles A. Gregg has been elected vice-president and S. B. Gregg secretary-treasurer of the company.

ALBANY, N. Y.—Control of the Hudson River Telephone Company, it is reported, has passed into the hands of the American Telephone & Telegraph Company. It is said to have been brought about by the purchase of treasury stock of the Bell Telephone Company of Pennsylvania and exchanging same for the stock of the Hudson River Telephone Company. The move on the part of the A. T. & T. Co. is said to be in line with a policy to consolidate all the principal Bell companies in New York State into the control of the Central New York Telephone & Telegraph Company, which has its headquarters in Syracuse.

RENSSELAER, N. Y.—The Rensselaer Telephone Company is equipping its building, recently purchased for an exchange. The company expects to have close to 600 subscribers when it is ready to begin business.

GOODRICH, N. D.—G. Mauch has purchased the local telephone system from John Wittmayer.

ATHENS, OHIO.—The Athens County Home Telephone Company has reported to the city clerk that all its wires will be placed in conduits encased in cement, about two feet below the surface of the ground, and that only a few of its poles will be left standing. A common battery system is also to be installed.

GUTHRIE, OKLA.—Telephone companies throughout this State are filing with the Oklahoma Corporation Commission, reports giving the physical value of the plant, number of miles operated, etc., and when the statements are all in a report will be issued by the Commission showing the condition of the telephone industry in the State.

GUTHRIE, OKLA.—The Corporation Commission recently took evidence in the application case of L. T. Hines, owner and manager of the Purcell-Lexington lines, for a raise in rates from $1.00 for residence to $1.50, and from $1.50 to $2.00 for business telephones.

YOE, PA.—The Yoe Telephone Company has completed the construction of its lines, and this place is now receiving service. The officers of the company are: President, Isaac Kohler; secretary and treasurer, C. S. Snyder; directors: B. S. Taylor, A. L. Clay, G. A. Kohler and J. K. Taylor.

MADISONVILLE, TEX.—H. B. Huston, for years manager and owner of the Central Texas Telephone Company, of this place, has sold his interest to A. B. Foster, of Huntsville, and C. F. White, of Madisonville. Mr. White will succeed Mr. Huston as manager.

OTHELLO, WASH.—The Farmers' Telephone Company, now operating between Othello and Cunningham, has decided to discontinue the Cunningham terminal and run its lines to Hatton. Business men at Hatton have offered to construct several miles of line leading to the town as an inducement for obtaining the connection.

SPOKANE, WASH.—The Home Telephone and Telegraph Company has been granted an extension of time until Dec. 1, 1910, to complete its plant and system in this place, which involves an expenditure of $600,000. The company has an exchange building at Howard street and has done considerable conduit and pole work.

DUNRAE, MAN., CAN.—The municipality of Riverside has given up the idea of constructing a rural telephone system, as a promise of a government system has been received.

UNDERGROUND.

HIAWATHA, KAN.—The Mutual Telephone Company is placing all its wires in this city underground.